VOLUME 20 NOVEMBER 1958 NUMBER

COLLEGE OF COMMERCE AND
BUSINESS ADMINISTRATION

CURRENT ECONOMIC COMMENT

UNIVERSITY OF ILLINOIS

CURRENT ECONOMIC COMMENT

Vol. 20 November 1958 No. 4

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Vol. 20, No. 4, NOVEMBER, 1958. Issued quarterly, in February, May, August, and November. Application for re-entry at second-class postage rates at Champaign, Illinois, is pending.

CURRENT ECONOMIC COMMENT is published quarterly by the Bureau of Economic and Business Research, College of Commerce, University of Illinois. This quarterly presents factual information and interpretive comment on economic developments, business operations, public policy, and related questions of current interest. It is available on request.

The opinions expressed in the articles are the personal views of the respective authors and not necessarily those of the College of Commerce or the University.

Address manuscripts and other communications to Bureau of Economic and Business Research, Box 658, Station A, Champaign, Illinois.

Some Reflections on a Trip to the Soviet Union

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OPPORTUNITIES to observe Soviet society at first hand, though increasing, are still rare enough to cause the privileged traveler to feel a responsibility to communicate to others what he has seen and experienced. In making such a report one is necessarily both selective and somewhat subjective. It is important, therefore, both to draw the reader's attention to possible sources of bias and to indicate as clearly as possible the basis upon which one's impressions have been formed. Accordingly, I shall begin with a brief comment on the nature of my recent visit to the Soviet Union and the opportunities which it provided for observation.

My status was that of an ordinary tourist, and my stay was for thirty days, the maximum period for which a tourist visa is usually granted. Within fairly broad limits I was able to select — in advance — my own itinerary. My stay was divided mainly between two cities — Moscow (eighteen days) and Leningrad (seven days). This left time for two days each in Kiev and Odessa. I felt that a more leisurely trip of this kind was preferable to the alternative of traveling constantly to see as many different places as possible. The cities visited are mentioned in order that you may be aware how very small and nonrepresentative a portion of Russian life I was able to observe: life in four cities of European Russia and the Ukraine. Although I made several trips by automobile into the surrounding countryside near Moscow and Leningrad, my observations were fleeting. Even within the cities, my view was certainly fragmentary. For example, aside from several professional conferences in the offices of the State Bank, the Ministry of Finance, the Institute of Economics in Moscow, and the library of the University of Leningrad, my access was limited to public places: my hotel, restaurants, stores, theaters, museums, churches, and the like. I was never invited to anyone's home and did not visit schools in session, the public courts, centers of physical science, or a wide variety of other institutions.

Because of the necessarily fragmentary nature of my opportunities to ob-

[1] Professor Hodgman visited the Soviet Union in the summer of 1958. He has for many years studied the Soviet economy and is the author of the pioneering work *Soviet Industrial Production, 1928-1951.*

serve, I made no attempt at systematic collection of economic data such as wage rates, prices, family size, or housing accommodations. It is doubtful that such scattered data could be significant. Moreover, various technical studies made in the West on the basis of published information had already answered a number of the questions that could be raised in these areas. I knew that living standards were well below those of the United States and Western Europe with respect to clothing, diet, consumers' durables (refrigerators, washing machines, automobiles, and so on), and housing. During my trip I did not see anything to challenge these conclusions. (Incidentally, books of all kinds are very cheap even for Russians, and Americans find that excellent seats to fine ballet, opera, and theater performances are cheap at the tourist rate of exchange of ten rubles to one dollar.) I *did* have a definite professional objective — to discuss with officials of the State Bank and with monetary and financial economists the money and credit policies of the State Bank and the relation of the State Bank to the state budget. My inquiries received very courteous attention from the officials concerned. Aside from these limited professional contacts, my approach was simply to open myself as much as possible to impressions of Soviet society as I went about my daily tourist pleasures.

I.

Having put the reader on guard against being too much persuaded by what follows, I should like to state, and in some instances illustrate, several general impressions which struck me with great force during my trip. I shall then relate these impressions to some views about Russian society which I hold as a result of professional study, and finally suggest a few conclusions for consideration.

My most significant impression has to do with the attitude of the Russian people toward the society in which they live. I did not see a shred of evidence to indicate that the Russians are discontented with the general economic and political structure of their society or that there was anything which by the remotest stretch of the imagination could be termed "latent unrest." This does not mean that the average Russian is satisfied with his standard of living. He certainly is not — indeed he may be rather keenly dissatisfied with inadequate living space, a limited diet, the prohibitive cost of private transportation in the form of a motorcycle (let alone a car), and similar matters. But in the last thirteen years there has been a marked improvement in material conditions of life: much new housing has been built, more goods are available, real wages have risen as consumers' prices have dropped. Moreover, the party and the government have done their utmost to impress on the populace the magnitude of the Russian achievement in industrialization which has brought the Soviet economy to a rank second only to the United States in total industrial output and of the scientific achievement represented by the Sputniks. All the principal papers in the USSR carry daily at their front page mastheads the world-girdling

schedule of Sputnik III as it passes over Shanghai, New Delhi, Moscow, Paris, Montreal, San Francisco, Tokyo, and other cities. The average Russian is proud of Russian achievements in industry, in science, in housing construction, in education, in ballet and music. He identifies with this achievement. A phrase which occurs again and again in private conversation with foreigners is "U nas" — With us — it is this way. How is it *with you*? We do it thus. We have this. What about you? How do you do it? What do you have? Some of this pride is naïve pride which springs from ignorance about the achievements of the West. But the fact remains that there is a sense of personal identification with national achievements, some of which are in fact outstanding.

From my observations I should say that the average Russian tolerates the present and looks to the future with confidence and hope. And the future toward which he looks is within the present economic and political framework of his society — not, perhaps, in all its details but in its major features. I include here the system of state ownership and the planned economy, as well as the leadership and control of the central government and the Communist Party in matters of national and international policy formation. The tolerance of the present is further supported by a scorn for hardship and a pride in personal endurance which strikes me as a kind of national characteristic. Given this attitude, it is my belief that most Russians would find the present living standard endurable indefinitely should they be able to rationalize the failure of it to improve in terms of external pressures from aggressive capitalistic powers.

I am less sure of my ground when it comes to attitudes toward the political aspects of life in the Soviet Union. I refrained from raising awkward questions of this nature for fear of loosing such rapport as I might have had with individuals with whom I spoke informally. But my impression is that most Russians are largely a-political in their attitudes toward affairs of government and party. Lacking a free press and a tradition of free enterprise in politics, barred from forming pressure groups, let alone political parties, accustomed to rubber-stamp elections and a tradition of the political elite, the average Russian regards government and politics more as a spectator sport than as an activity in which he may become personally involved. Therefore, so long as his economic needs are cared for, and now that the sense of personal insecurity associated with the political terror has greatly abated, the average Russian probably finds the present system of political elitism quite acceptable. Although the increase of the well educated may eventually modify this indifference, this does not seem to be an immediate factor of any weight in respect to the stability of Soviet society.

The average Russian's pride in Soviet achievements has been mentioned. It is worth recording that this extends to a concern by Russians with the impression that foreign visitors may form while traveling in the Soviet Union. I do not mean just the officials and guides with whom one comes in contact. This is to be expected of them.

But rather the average person. This can be illustrated by an incident which occurred one day in the suburbs of Moscow. I had just taken a picture of a picturesque and rather shabby old log house, of which there are a number on Moscow's back streets, when I noticed a young man of about 20 standing nearby, half-smiling and shaking his head. I smiled in return and asked him what he was thinking. He replied: "You are photographing just the unfavorable scenes." I assured him that I had taken pictures of many pleasant and impressive sights but wished to record a balanced impression. The young man, an unskilled clerk for a construction supply firm as it turned out, then spontaneously took on the task of informal guide to point out some of the attractions of his neighborhood. His intelligent interest and his courtesy made a lasting impression.

II.

A second major impression took the form of increased awareness of the extent to which the average Russian is restricted in his access to all but official channels of information in the form of press, radio, and television. Nowhere was I able to buy a newspaper or magazine that was noncommunist in its sponsorship. There were foreign language newspapers in the kiosks in Moscow and Leningrad — newspapers in English, German, French, Polish, Hungarian — but without exception they were the *Daily Worker* and its compatriots. I did not see a single magazine or journal in English save for those published in the Soviet Union. My guide told me that foreign newspapers such as the *New York Times* were available in the libraries. During my tour of Lenin Library — a magnificent library of some 19 million volumes (compared with 11½ million at the Library of Congress) — I observed no nontechnical foreign journals and no foreign noncommunist newspapers on the open shelves. When I inquired for the *New York Times,* I was told that they had only one copy and so kept it in the stacks to preserve it. To obtain anything from the stacks the borrower must sign his name. This is a serious deterrent to use of disapproved foreign language materials — a fact confirmed to me directly by a young man who was studying English at the University of Leningrad.

In my interest to improve my spoken Russian I listened frequently to both radio (short and conventional wave lengths) and television in my Moscow hotel room. At no time did I encounter any foreign language broadcasts other than those emanating from Radio Moscow. That fact plus the incessant and unrelenting shaping of all program materials to the propaganda purposes of the regime are my two principal impressions concerning radio and television. Instead of the private commercials familiar to us, there is a steady dinning away on the need for increased production, a constant reiteration of the advantages of the socialist system of economic and political organization, an endorsement of party leadership, and a one-sided presentation of international news to stress the righteous, peace-loving, and high-minded approach of Soviet officials to the interests of the little man everywhere.

Even books are censored and barred. The Russians pride themselves on their familiarity with foreign authors—sometimes in translation, often in the original. But the books by American authors which they read are those of Mark Twain, James Fenimore Cooper, Herman Melville, and Jack London, or possibly those of Howard Fast (now, however, in disgrace in the Soviet Union). Almost no current volumes of American belles-lettres are available to the general public, let alone serious works in philosophy, law, politics, international affairs, history, biography, and sociology.

Until I experienced this complete control of the media of public information I could not appreciate its effectiveness. But during my trip I had a striking demonstration. While I was in Leningrad there occurred the overthrow of the Iraq government and the American and British landings in Lebanon and Jordan. Of course the Soviet government leveled the charge of outright aggression against the American and British governments. And the press, radio, and television took up this theme. Now the point is that the media of information not only presented the news in a strongly interpretive manner but they reported it on a highly selective basis. For example, the *objections of the speaker of the Lebanese Parliament* to the landings of American troops were reported but not the *appeal by the Lebanese president* for American troops. Moreover, the American and British press were culled for derogatory and highly critical comments by well-known public figures who were not in agreement with the decision to land troops. The world Communist press was cited with its datelines of New Delhi, Paris, New York, and London to create the impression of a world-wide ground swell of popular revulsion against the American and British "armed intervention."

What was the effect of all this? Despite my own great interest in these events, despite my background of recent information and my knowledge of Soviet methods, despite my concern to appreciate the position of the United States government in this affair, the sheer lack of balanced information made it extremely difficult for me to construct a defense for the policy of my government. I was not alone in this dilemma. Other American and English tourists had the same difficulty.

This experience points to the following conclusion. A general attitude of mistrust and skepticism may be possible in an environment of controlled information, but positive, hard-hitting criticism of the image which is presented through the controlled media of information is impossible save on the basis of access to more complete information or an interpretive framework previously constructed out of more complete information. In short, it is extremely difficult for the average Soviet citizen to think critically about *international affairs in particular,* immersed as he is in an environment where the schools, public officials, books, newspapers, radio, television, and official ideology all present a stereotype of Western societies and governments as aggressive, capitalistic imperialists bent inexorably on economic or military conquest and

driven by a social dynamic beyond the control of their warped leadership.

What has been said thus far can be summed up in this way. I believe that the average Russian is reasonably satisfied with domestic *trends and achievements* and sees his future within the existing framework of Soviet society. Moreover, I think the average Russian has little opportunity to dispute the official interpretation of international affairs which he receives from his government. Putting these two statements together I conclude that there is nothing domestically to prevent the Soviet leadership — both party and official — from pursuing the major parts of both its domestic and foreign policies. We are confronted, in short, with a Soviet system which has to its credit important and demonstrated successes in both its domestic and international affairs and which gives every evidence of being both able and willing to pursue further its stated aims in both spheres. What this may mean for us I should like to attempt to sketch in the following sections.

III.

That aspect of the domestic program of the Soviet leadership that has the most important implications for the United States is the goal of continued rapid economic growth, especially industrial growth. Several years ago on the basis of a statistical study of Soviet industrial growth in the period 1928-54, I hazarded a guess that industrial output might continue to expand at an average annual rate of 8 percent through 1970. So far, the available evidence appears to indicate that this estimate is, if anything, a trifle low. The Russians themselves are projecting a rate of 10 percent in industry, which, however, is only about one-half the rate they claimed for the prewar five-year plans. Nevertheless, even 8 percent a year is a growth rate in industry double that which experience indicates as a maximum normal rate of growth for industry in the United States.

This is not the occasion to speculate in detail on factors which may retard or stimulate the Soviet rate of growth in the future. But a few aspects may be touched on lightly. There are some obvious sources of retardation: the wartime demographic catastrophe is about to appear in the form of unusually small additions to the labor force for the next six or seven years. It is more difficult for the Russians to maintain the rate of net investment in basic industries (such as metals, machinery, and mining) upon which the growth of industrial capacity depends, because of greater physical depreciation in the existing, more mature capital stock than formerly and also because of competing claims on investment from the spheres of housing, transportation, consumers' goods, agriculture, and military expenditures. Opposed to these retarding tendencies are the greater average skill level of the labor force than before the war, the existence of a machine-tool industry which, according to Allen Dulles, director of the Central Intelligence Agency, produced last year almost double US output of basic machine tools, the possibility of technological innovations to raise productive efficiency, and evidence of increasing willingness and ability to adopt a more

flexible approach to solve some of the traditional major shortcomings of the Soviet economy — specifically the malaise in agriculture and the problem of overcentralization in the structure of industrial administration.

Since Stalin's death in 1953, Soviet domestic economic policy has displayed much greater flexibility and willingness to experiment than in the preceding two decades. Soviet agricultural policy has undergone major changes. In 1953 procurement prices paid by the government for vegetable and livestock products were sharply raised to provide greater incentives to the farm population to produce and market these products. In that same year a vast program for cultivating virgin prairies in Central Asia was begun. So far, despite the marginal rainfall characteristics of the area, the new lands program has succeeded in adding significantly to the supply of grain. On January 1, 1958, collective farmers, workers, and employees were freed of compulsory deliveries of farm products from their private plots. In the spring of this year the Soviet government announced a plan for the gradual transfer of heavy agricultural equipment from the machine-tractor stations to the collective farms with a plan for the conversion of the stations from custom farm machinery centers to repair and maintenance stations. To appreciate the significance of this change, we need to bear in mind the traditional function of the MTS in guaranteeing the collection of agricultural products according to government needs. On July 1 of this year the government simplified the system of government procurement of agricultural products by abolishing obligatory deliveries and payments in kind for MTS work and replacing it with a system of government buying at uniform prices — a great administrative simplification.

Industry also has undergone reforms. In May, 1957, the government and the party announced the reorganization of industrial administration. They set up 105 regional economic councils and transferred a substantial share of operative control over production to the level of the constituent republics, thus sharply reducing the role of the central industrial ministries. The number of these ministries was reduced from 52 to 25. These measures have been accompanied by an increasing amount of discussion in academic circles and the press of topics pertinent to the efficient allocation of economic resources: among subjects considered are the role of prices and how correct prices may be obtained, the use of the interest rate in capital rationing, and proper allowance for capital depreciation in cost accounting.

This willingness to experiment with new organizational forms and to consider seriously economic concepts which have previously been neglected for doctrinal reasons or out of ignorance is doubly significant. It suggests that the Soviet leadership is intelligently alert to improvements in procedures and feels secure enough to experiment without the danger of the experiment getting out of control. It may be stressed that none of the reforms mentioned appears to signify a change in domestic economic goals but rather only a more intelligent pursuit of these goals.

A few years ago in some circles we used to ponder the question, Whose side is time on? There is no doubt about the Russian answer to this question. Consider this quotation translated from an article in *Pravda* of July 9, 1958 — an article comparing the economic growth of the Soviet Union with that of the West and in particular with that of the United States.

> Proceeding from the present level of production in the USSR and the USA and these countries' rates of industrial growth — an average of 10 per cent annually in the USSR and approximately two per cent annually in the USA — it should be assumed that in the next seven to eight years the Soviet Union will achieve the present [that is, 1958] level of total industrial output of the USA and in still another two to three years will overtake the USA with allowance for the possible expansion of the US economy. Since it can be expected that by that time the population of the USSR will be 15 to 20 per cent larger than that of the USA, only a few more years will be needed to overtake and surpass the USA in per capita output, that is, to accomplish the main economic task. . . . As for labor productivity in industry the Soviet Union has already surpassed Britain and France and is approaching the level of the Federal Republic of Germany. It is approximately 50 per cent of US but growing at 6-8 per cent per year as compared to US growth of 1-2 per cent.

These are Russian statistics and Russian forecasts, but the trends they portray are not very different in general order of magnitude from the findings of comparable studies conducted in the West. It is a fact that the Soviet economy has gained steadily in productive capacity compared with the West in recent decades. If past and present performance portends the future, this growth in comparative economic strength will continue.

IV.

For our society the most important implications of the growth in comparative Soviet economic strength emerge on the international scene. Soviet economic history under the five-year plans stands as a forceful and compelling demonstration of how to overcome the classic obstacles to economic development of a backward economy: how to extract a surplus from agriculture, mobilize savings, restrict consumption, turn peasant villagers into industrial workers, sweep away the feudal landholder — in short, under strong centralized direction how to harness the full energies of an economically backward society to meet the challenge of economic self-development. Not only does the Soviet economy stand as a successful model of economic development, but it also may, under proper conditions, serve as a source of material aid to other countries.

In the competition for the loyalties of the governments and the peoples of Asia, Africa, and the Middle East (and possibly South America), the Soviet government offers a specific and complete proposal for economic and political reform — or, if you like, revolution. What is our concrete alternative? True, we offer military and economic aid; but more often than we

have been willing to recognize, this is mere temporizing. We have not been willing to face squarely the problem of economic organization and political reform. Governments of underdeveloped countries face a growing popular desire for economic improvement. What means, short of centralized direction of fully mobilized economic resources, will enable these societies to break out of economic stagnation into dynamic economic growth?

One seriously doubts whether the characteristics of many of the Asian, African, and Middle Eastern social and economic orders are such that the forces of private initiative can bring about economic development even with the generous help of the United States or Western Europe. Yet *no* government and *no* social order can endure in these countries without satisfying the popular demand for economic improvement. Thus we must either develop a constructive, positive alternative to the Russian system or face the prospect of seeing one after the other of the uncommitted countries slide or be sucked into Communism. It is not our responsibility to do this, but it is very much in our interest.

It is surely a difficult and perhaps an impossible task for a pluralistic society such as ours to promote abroad economic and political reform and a program of economic development which rest on tenets different from our own. But the alternative of a continued shift in the world balance of power and eventual isolation is so ominous in its implications that we must try.

It is almost commonplace to say that our society faces the gravest peacetime threat in its history. In my view, this threat is not that of the balance of military power (unless a technological development should produce a decisive swing) but rather that our society may be unable to adapt so as to meet a new set of requirements imposed by changes in the world environment. Our political and economic systems are undergoing a severe challenge in their bid for the loyalties of persons everywhere. Thus far, I believe, we have not succeeded in meeting this challenge. If we but open our eyes we will see that we have been losing ground steadily since the end of the war. Time is not on our side so long as we fail to mobilize our full energies to meet this challenge. And time is growing dangerously short if we wish to preserve the essential individualistic values of our society. This is not a problem which can be met by invoking the shibboleths of "democracy" and "free enterprise." We must act to give content to these terms and to correct some of the obvious defects in our society. We can no longer afford a significant depression. We must solve the problem of discrimination posed by the integration crisis. We must improve our educational system to nurture the creative abilities in our society. But these tasks alone, difficult as they are, are not enough. We must be prepared to evolve creatively in forms of

social and economic organization while clinging to those essential principles of human freedom and dignity which are our living secular faith. If we cannot do this we will find ourselves living in a society not of our own choosing, a society which, whatever its intermediate stages, will eventually be collectivist in nature on the Russian model. Whether we like it or not we are all individually involved and, in a sense, individually responsible for the nature of the outcome. Let us hope that we have the intelligence and courage to meet the challenge in a creative way.

The Cyclical Nature of Investment in Retail Inventories

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THE BEHAVIOR of capital investment in inventories has become a subject of increasing interest to economists and business analysts. One of the most significant discoveries which has resulted from research in this area is that inventory investment as a whole has been subject to pronounced cyclical fluctuation. In a pioneering study by the National Bureau of Economic Research, it was concluded that during the interwar period (1919-38) changes in business outlay for inventories was a major contributing factor to cyclical swings in total output.[1]

Business inventory is of course a composite value. Its behavior is the result of change in the amount of stock-in-trade held by various manufacturing, wholesale, and retail firms. Accordingly, the significance and implications of cyclical change in business inventories can be understood only through studying the behavior of these constituent categories. Considerable progress has been made in describing the timing, duration, and magnitude of cyclical movements in manufacturing inventories. However, comparatively little is known about the behavior of inventory investment at other levels in the distribution system.

Data which would permit a study of inventories held by distribution agents comparable in scope to the studies of manufacturing inventories simply do not exist. Even the retail and wholesale inventory statistics which are available lack the reliability and comparability of the manufacturing series.[2] Nevertheless, this material does not seem to be so limited that an analysis of it could not make some contribution to a better understanding of the inventory problem.

It is the purpose of this paper to discuss some of the cyclical characteristics of inventory investment which are disclosed by an analysis of available retail inventory statistics. Over the past two decades, the value of inventories held by retailers has averaged about 27

[1] M. Abramovitz, *Inventories and Business Cycles* (New York: National Bureau of Economic Research, 1950).

[2] *Report of the Consultant Committee on Inventory Statistics* (Washington: Board of Governors of the Federal Reserve System, November, 1955), Appendix E.

percent of the total book value of business inventories. This is about twice the value of average wholesale inventories and about one-half the value of average manufacturing inventories during the same period. Retail holdings of nondurable goods have averaged roughly 31 percent of total nondurable inventories, whereas the retail share of durable stocks has averaged about 23 percent of the total figure. In terms of its relative value, capital commitment in retail inventory is not particularly impressive. But this commitment is of sufficient size that any substantial change in it would have a significant effect on the flow of purchase orders back through the channel of distribution.

Measuring the Retail Component

The data studied consist of Department of Commerce estimates of retail stocks for the period spanned by the last three cycles in general business, i.e., 1938-54. All estimates are of end-of-month book value at cost or cost equivalent. These estimates are available in three general series (aggregate, total durable, and total nondurable) and six individual series (apparel, automotive, food, furniture and appliance, general merchandise, and lumber-building-hardware). All series are adjusted for seasonal variation. The six individual series represent, on the average, about 73 percent of the value of aggregate retail stocks.

For the most part, measures of cyclical behavior employed are those developed by the National Bureau of Economic Research. These consist of statistical comparisons and breakdowns designed to reveal the timing, duration, and amplitude of identifiable cyclical movements. A description of the mechanical details of these methods will be found in appropriate footnotes.

When plotted on a semilogarithmic grid, most of the retail series display periodic wavelike movements. On the whole, it is possible to distinguish among these movements those which appear to be too regular to be interpreted as random fluctuations and which are too pronounced to be attributed entirely to the effects of trend. In accordance with the terminology of the National Bureau, these periodic movements of rise and fall which are peculiar to a series are called the "specific cycles" of that series.[3] These specific cycles constitute the basic unit of the analysis.

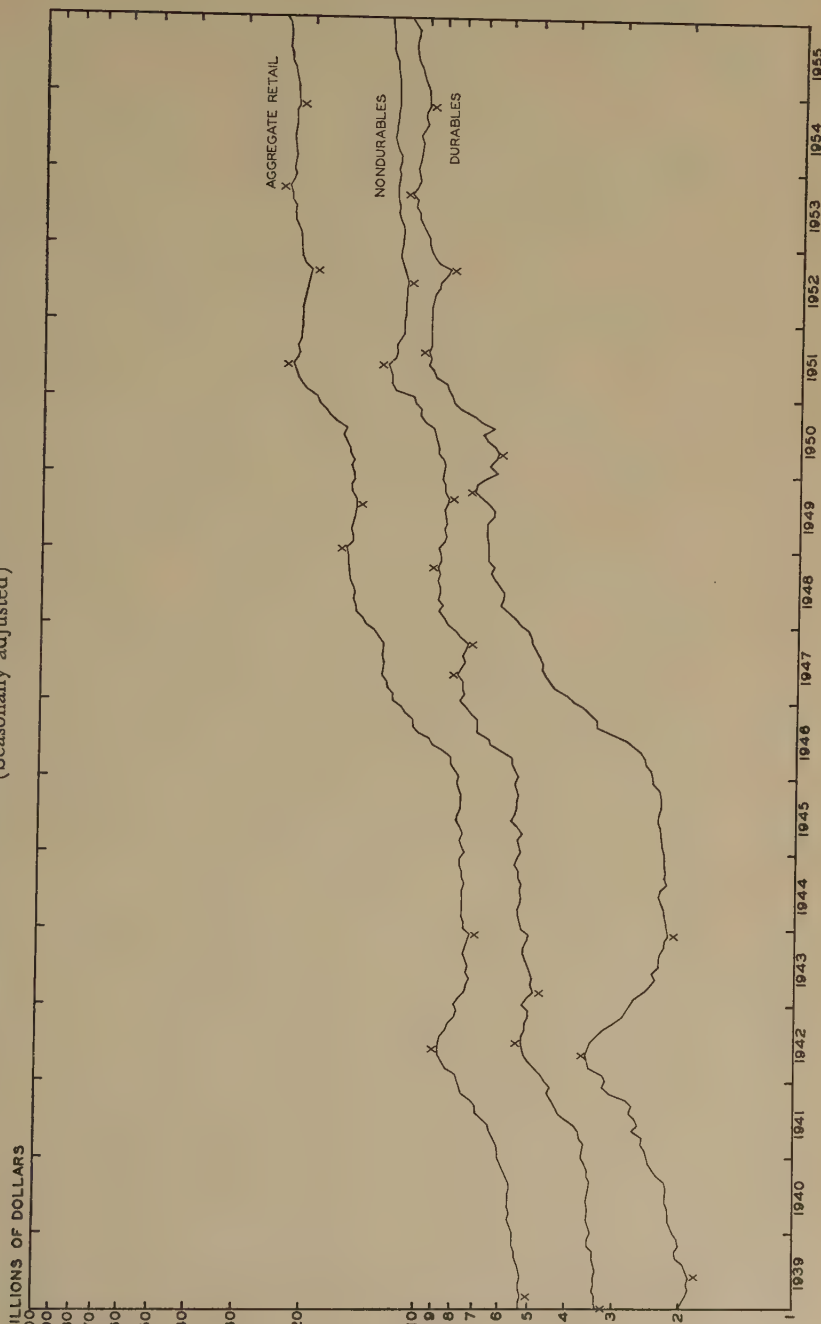
Cyclical Movements in the General Retail Series

Aggregate end-of-month retail stocks together with the durable and nondurable components of the aggregate figure are plotted on Chart 1. The peaks and troughs of the specific cycles in each series are indicated by x's. In general, the lowest and the highest points of a plotted curve are taken as the troughs and peaks of its cycles. In some instances the dates of these turning points are fairly clear, but in others they are obscured by erratic and seculiar movements. In order to place the selection of turning points on a reasonably objective basis, two simple rules were followed.

[3] A. F. Burns and W. C. Mitchell, *Measuring Business Cycles* (New York: National Bureau of Economic Research, 1947), p. 24.

Chart 1. Aggregate, Total Durable, and Total Nondurable Retail Inventories, 1938-55

(Seasonally adjusted)



(1) A rise and fall in a series was not classified as a cycle unless its duration, measured either from peak to peak or trough to trough, was at least fifteen months.

(2) Fluctuations lasting less than two years were scrutinized with especial care. Such movements were not treated as specific cycles unless they were clearly defined and gave no evidence of being the result of an inadequate adjustment for seasonal variation.

Although such rules still leave much room for arbitrary decisions, there is a good chance that they exercise enough discipline over judgment to minimize bias.

The cyclical behavior of these three series in terms of the timing, duration, and amplitude of their specific cycles is given in Table 1.[4] One of the most striking characteristics of these cycles is the greater duration of the expansion phase. Indeed, the average length of contractions has been only about one-half — and in the case of nondurables about one-third — of the average length of expansions. The duration of the cycles has averaged about 47 months in the aggregate series. Cycles in durable goods stocks, however, appear to have been a bit longer on the average than those in nondurables — 46 months as compared with 41 months.[5]

A comparison of amplitudes also discloses some interesting characteristics.[6] It is evident that on the average, cyclical expansions have not only been of longer duration than contractions but also of greater magnitude. In aggregate inventories the average amplitude of expansions has been nearly four times that of contractions. In the case of durable goods the amplitude of expansions has been about one-third greater than that of the nondurables. Average contractions in durables, on the other hand, have been about four times as

[4] Following National Bureau procedure, each specific cycle is divided into two phases, an expansion and a contraction. The expansion phase is defined as the interval from the midpoint of the date of the initial trough to the midpoint of the date of the peak; the contraction is the interval from the midpoint of the date of the peak to the midpoint of the date of the terminal trough. The duration of the full cycle is obtained by summing the lengths of the expansion and contraction. In the case of an incomplete cycle at the beginning or end of a series, whichever phase can be ascertained is recorded in the table but excluded from the average.

[5] Since each series is analyzed independently of the others, the average duration of cycles in the durable and nondurable component series will not necessarily correspond to the average duration of cycles in the aggregate series.

[6] The amplitude of a specific cycle is computed, following the National Bureau, by determining the average value of a series during a cycle and expressing each (seasonally adjusted) figure of the series as a percentage of the average value of the series during the cycle. These percentages of average value during a cycle are referred to as cycle relatives. The amplitude of a cycle is then measured by the difference between the cycle relatives at the peak and at the troughs of the cycle. The amplitude of an expansion of a given cycle is the difference between the cycle relative at the midpoint of the initial trough and the relative at the midpoint of the peak. In the same manner the amplitude of a contraction is the difference between relatives at the midpoints of the peak and the terminal trough. The full-cycle amplitude is the sum of the amplitudes of the expansion and contraction phases of the cycle.

The virtue of this method is that it expresses the amplitudes of different series in terms of the same unit and thus facilitates comparisons.

Table 1. Duration and Amplitude of Specific Cycles in Aggregate, Durable, and Nondurable Retail Inventories, 1938-55

Dates of specific cycles	Duration of cyclical movements (months)			Percent of duration of full cycles		Amplitude of cycle relatives			Per month amplitude of		
Trough-peak-trough (1)	Exp. (2)	Contr. (3)	Full (4)	Exp. (5)	Contr. (6)	Exp. (7)	Contr. (8)	Full (9)	Exp. (10)	Contr. (11)	Full (12)
Aggregate											
Feb 39—May 42—Nov. 43	39	18	57	68	32	51.5	20.0	71.5	1.3	1.1	1.2
Nov. 43—Dec. 48—July 49	60	7	68	90	10	76.0	5.4	81.4	1.2	.8	1.2
July 49—May 51—Aug. 52	22	15	37	59	41	36.7	8.2	44.9	1.7	.5	1.2
Aug. 52—Sept. 53—Oct. 54	13	13	26	50	50	10.4	2.9	13.3	.8	.2	.5
Average[a]	33.7	13.2	47.0	66.7	33.2	43.6	9.1	52.8	1.5	.6	1.0
Average deviation[b]	16.2	3.2	15.5	12.2	12.2	20.1	5.4	23.7	.3	.3	.3
Weighted average[c]									1.3	.7	1.1
Durables											
May 39—Apr. 42—Nov. 43	35	19	54	65	35	63.4	51.8	115.2	1.8	2.7	2.1
Nov. 43—Sept. 49—Mar. 50	70	6	76	92	8	114.9	15.8	130.7	1.6	2.6	1.7
Mar. 50—July 51—Aug. 52	16	13	29	55	45	37.2	8.9	46.1	2.3	.7	1.6
Aug. 52—Sept. 53—Oct. 54	13	13	26	50	50	17.3	6.6	23.9	1.3	.5	.9
Average[a]	33.5	12.8	46.3	65.5	34.5	58.2	20.8	79.0	1.7	1.6	1.6
Average deviation[b]	19.0	3.3	18.7	13.2	13.2	38.0	15.5	44.0	.3	1.0	.3
Weighted average[c]									1.7	1.6	1.6
Nondurables											
Dec. 38—June 42—Feb. 43	42	8	50	84	16	48.8	6.0	54.8	1.2	.7	1.1
Feb. 43—Apr. 47—Sept. 47	50	5	55	91	9	46.7	2.9	49.6	.9	.6	.9
Sept. 47—Sept. 48—Aug. 49	12	11	23	52	48	15.4	3.9	19.3	1.3	.3	.8
Aug. 49—May 51—June 52	21	13	34	62	38	34.4	9.3	43.7	1.6	.7	1.3
Average[a]	31.2	9.2	40.5	72.2	27.8	36.3	5.5	41.8	1.2	.6	1.0
Average deviation[b]	14.7	2.7	12.0	12.0	12.0	11.4	2.1	11.3	.2	.1	.2
Weighted average[c]									1.2	.6	1.0

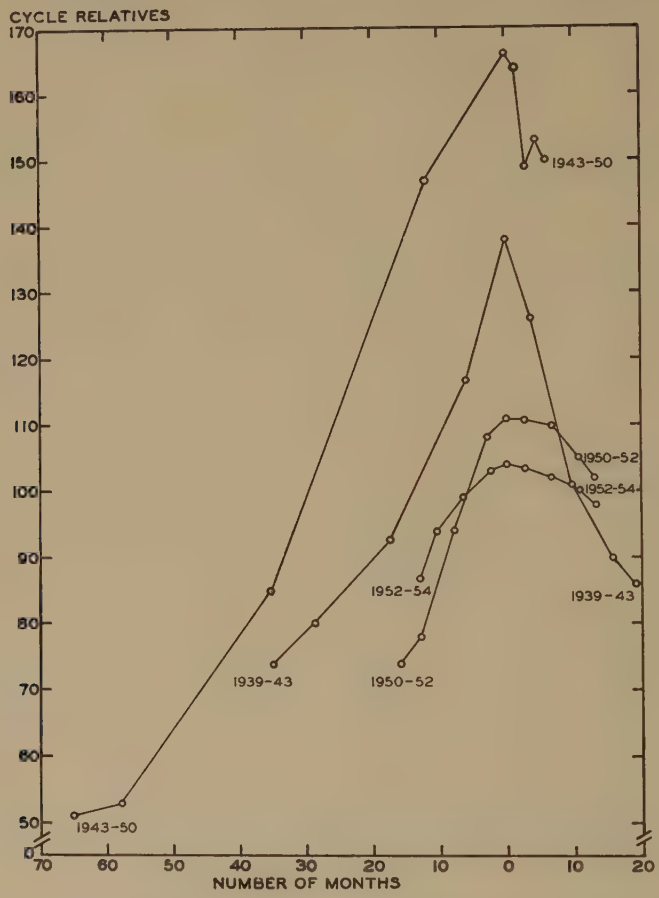
[a] Arithmetic mean determined separately for each column. Hence (2)+(3) may differ from (4) in the last place.
[b] Measured from the mean.
[c] Arithmetic mean of the rates of change weighted by the intervals to which the rates refer.

great as those in nondurables. The cycles which occurred during World War II appear to have been of conspicuously greater amplitude than those of more recent years. This difference between the "war years" and "peace years" is very pronounced in the durable series, particularly during contraction phases.

A further clarification of the pattern of cycles in retail stocks may be obtained by dividing the amplitudes of expansions and contractions by the duration of the periods over which they occurred. This step brings out the various rates of change during different cycles and therefore affords an indication of the intensity with which different cyclical movements occurred. This second set of amplitude measures is given in columns 10 to 12 of Table 1.

It is interesting to observe that when the durations of cycles are compared with their amplitudes, the differences between the cyclical behavior of war years and that of peace years is con-

Chart 2. Four Specific Cycles in Total Durable Retail Inventories, 1938-55

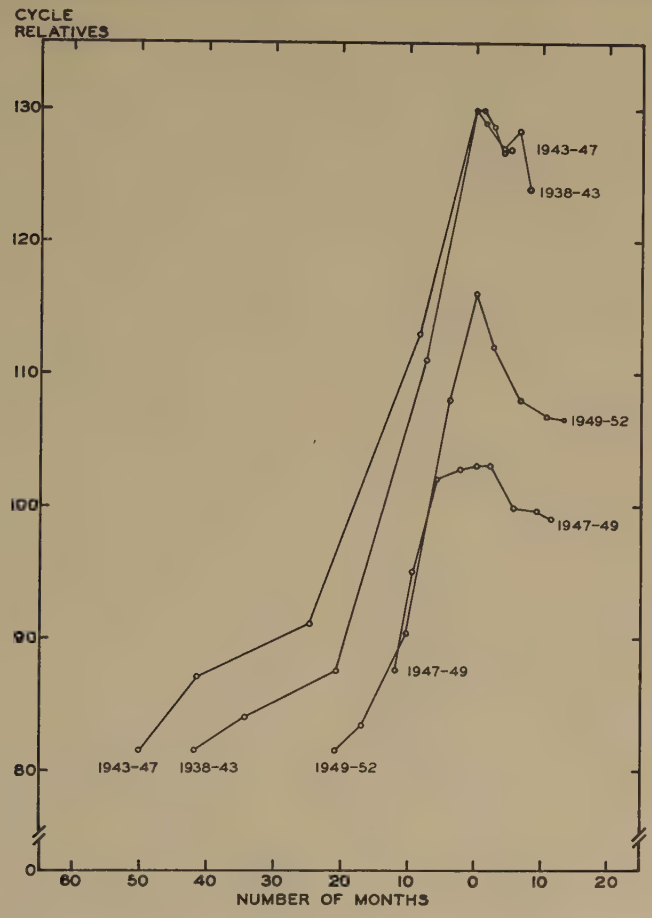


siderably lessened. The sharp contractions in durables after April, 1942, and September, 1949, still stand out; but for the most part there are no distinct dissimilarities in rates of change between war and nonwar years. The differences between expansions and contractions are also less marked when rates of change are taken into consideration. This is especially true in the case of cycles in the durable category. It may be observed in the aggregate series, however, that whereas the rate of change during expansions has tended to increase, the rate of liquidation during contractions has apparently remained about the same.

The clearest picture of cyclical movements in retail stocks may be obtained by dividing each specific cycle into a series of nine stages.[7] The nine-stage

[7] The division of a specific cycle into nine stages is accomplished in the following manner. First, the months in which the initial trough, peak, and terminal trough occur are designated as stages I, V, and IX respectively. Next, the expansion phase, i.e., the

Chart 3. Four Specific Cycles in Total Nondurable Retail Inventories, 1938-55



pattern traced by the cycles in durable and nondurable retail stocks is shown in Charts 2 and 3. The pattern of each

interval beginning with the first month after the initial trough and ending with the last month before the peak, is divided into three parts as nearly equal as possible without using fractions of months. Beginning with the third nearest the trough, these parts are designated successively as stages II, III, and IV. The contraction phase, i.e., the interval beginning with the month after the peak and ending with the month before the terminal trough, is also divided into thirds in the same manner as the expansion. Beginning with the third nearest the peak, these parts are designated consecutively as stages VI, VII, and VIII. Finally, the average standing of the cycle relatives in each stage is computed. Cf. Burns and Mitchell, *op. cit.*, pp. 145 f.

Two assumptions are implicit in this method of tracing cyclical patterns. One assumption is that the turns of specific cycles come in single months, i.e., that the peaks and troughs are rounded or angular at the extremities rather than flat. The other is that the phases of specific cycles cover a sufficiently large number of months that there is reasonable opportunity for erratic fluctuations to be cancelled out.

cycle is arranged so as to facilitate comparisons of the amplitude and duration of the expansion and contraction phases. It will be noted that the cycles have been plotted so that their peaks, i.e., the standings of cycle relatives at stage V, all coincide with the same vertical line. Although the standings at other stages are out of alignment, because of the different durations of the cycles, they can be readily identified from the small open circles which represent the midpoint of each stage.

The abrupt nature of the expansion phases and the relatively short, mild contractions are dramatically illustrated by these plotted patterns. The similarity of the expansion phases and the dissimilarity of the contractions are equally well illustrated. The greater amplitude and variation of cycles in durables as compared with those in nondurables is evident at a glance. The differences in duration and amplitude between cycles of recent date and those of earlier periods are also conspicuous. Cycles which have occurred recently are much less pronounced than earlier cycles.

Behavior of Individual Retail Series

Because of the composite nature of the general inventory series, an examination of the individual series should bring the picture already gained into a little sharper focus. When plotted on semilogarithmic paper, cyclical movements are identifiable in each of the individual series except foods. In this series there was not sufficient evidence of specific cycles to warrant an attempt to select turning points. The timing, duration, and amplitude characteristics of specific cycles in the remaining five series were analyzed in the same manner as those of the general series. The principal results of this analysis are presented in Table 2. In order to provide some sort of benchmark, two industrial series, both of which are recognized as possessing distinct cyclical movements, are also included in the table.

Several characteristics appear to stand out conspicuously in the comparisons afforded by Table 2. Foremost among these is the similarity in duration of the expansion and contraction phases of cycles in most of the series. With the exception of the lumber-building-hardware series, there are only a few months difference in the average length of periods during which different types of retail stocks are accumulated and liquidated.

An especially interesting aspect of the individual series is the marked differences in the amplitude of cyclical swings. For example, the amplitude of expansion phases varies from 42.3 in the apparel series to 81.3 in the automotive series. In the case of contractions, amplitudes range from 14.7 in the apparel series to 45.4 in the automotive series. It is clear that the apparel and automotive series represent the extremes in cyclical fluctuation.

The purpose of the amplitude measure, of course, is to indicate the magnitude of cyclical swings. By themselves, however, amplitude values give no clear indication of the significance of the magnitudes they measure. Nevertheless, the National Bureau measure of amplitude has the advantage of affording a comparison of the values in

Table 2. Measures of Cyclical Behavior, Major Constituents of Aggregate Retail Inventories and Two Industrial Series[a]

Categories	Period	Average duration (months)			Average amplitude of cycle relatives			Average net change per month in specific cycle relatives between stages							
		Exp.	Contr.	Full	Exp.	Contr.	Full	I-II	II-III	III-IV	IV-V	V-VI	VI-VII	VII-VIII	VIII-IX
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Aggregate retail inventories	1938-55	33.7	13.2	47.0	43.6	9.1	52.8	.4	.7	2.1	1.8	−1.1	− .8	− .5	− .3
Durables	1938-55	33.5	12.8	46.3	58.2	20.8	79.0	.8	1.5	2.5	1.9	−1.4	−2.7	−1.0	−1.0
Automotive	1938-55	29.0	18.0	47.0	81.3	45.4	126.7	2.2	2.5	2.3	4.3	−5.8	−3.1	− .8	−1.2
Furniture and appliance	1938-55	27.7	19.0	46.7	59.6	26.6	86.2	1.2	2.2	2.5	2.2	−1.7	−2.1	−1.1	− .3
Lumber-building-hardware	1938-55	48.0	20.5	68.5	73.3	17.7	91.0	1.0	.7	2.3	2.1	−2.3	−1.3	− .1	− .4
Nondurables	1938-55	31.2	9.2	40.5	36.3	5.5	41.8	.7	.5	1.6	2.0	− .8	− .9	− .1	− .6
Apparel	1938-55	29.0	11.2	40.2	42.3	14.7	57.0	1.4	.6	1.5	2.9	−1.0	−1.7	−1.4	− .5
General merchandise	1938-55	28.5	11.2	39.7	44.0	19.0	63.0	.7	.4	2.1	3.3	− .9	−1.7	−2.2	−1.7
Coke production[b]	1914-32	24.0	18.6	42.6	57.2	62.7	119.9	3.6	1.9	2.0	2.8	−2.0	−3.4	−3.7	−3.7
Bituminous coal production[c]	1907-38	30.2	15.0	45.2	38.7	38.5	77.2	2.3	.9	1.0	1.6	−4.5	−1.8	−1.8	−3.2

[a] All averages have been determined separately for each column. All are simple arithmetic averages except in columns 9 through 16 in which cases the arithmetic mean has been weighted by the intervals to which the rates of change refer.

[b] Burns and Mitchell, *op. cit.*, pp. 26 f. and 29 f.

[c] *Ibid.*, pp. 129, 133, and 150.

one series with those of others in which the significance of the amplitude has already been determined. If coke and bituminous coal production represent reasonable standards of comparison, the full cycles in most of the retail series display rather impressive amplitudes, despite their characteristically mild contractions. Indeed the full-cycle amplitude of automotive stocks exceeds that of both coke and bituminous coal production — series often used to illustrate pronounced cyclical behavior. Moreover, the rate of expansion and contraction in automotive stocks (columns 9-16, Table 2) exceeds that of coke production in four out of nine stages and of that of bituminous coal production in five out of nine stages.

The similarity in cyclical behavior of the two nondurable series is another evident feature. This is well illustrated in the rates of change from stage to stage (columns 9-16, Table 2). On the average, cycles in both series begin their expansions slowly and reach their greatest momentum just before the peak. Contractions in both series begin slowly and accelerate during the middle stages.

It is also interesting that there appears to be a general tendency for the greatest rate of change in the accumulation and liquidation of retail stocks to occur just preceding and just following a peak. Even in stages adjacent to a peak, however, rates of change during contraction phases are typically less than during expansions. Thus, contraction phases appear to be shorter in duration and milder in amplitude than expansions — that is, they are apparently less violent.

Some Probable Causal Influences

Generally speaking, the pattern of retail inventory accumulation and liquidation reflects the influence of prewar, war, and postwar conditions on retail trade. Declining prices and uncertain demand during the early thirties undoubtedly created a sensitiveness to inventory risks and a determination on the part of retailers to minimize them. But the rapid depletion of retail stocks during World War II and the high level of postwar consumption tended to dislodge retail inventory policy from the hand-to-mouth thinking which prevailed during the thirties.

The extended cyclical upswings characteristic of the 1938-55 period reflect efforts to accumulate inventory in anticipation of wartime scarcities as well as to replenish and rebuild stocks following World War II. The change which occurred in price levels over this period also contributed to upward movements in inventory values. The relatively short, mild contractions of this period — which can best be described as interruptions in the rising trend of inventory investment — are very likely a result of the continued high level of postwar consumption. The persistence of high-level consumption and the consumer optimism which is so much a part of it would seem to account in large part for the relatively mild character of recent inventory cycles (illustrated in Charts 2 and 3).

The greater amplitude and variation of specific cycles in durable goods inventories as compared with nondurable can be attributed to several influences. For the most part, durable goods are of relatively high unit value and usually

represent an expenditure of some importance in the consumer's budget. Consequently, uncertainties concerning future income are more likely to be reflected in the postponement of durable goods purchases than in the postponement of nondurable purchases. Indeed, the very durability of durable goods renders it easy for the consumer to delay the purchase of replacement items until he feels he can afford the expenditure. Aside from the matter of cost, it is no doubt a little easier to make an old piece of furniture or an old appliance last through another year than to make an old suit or an old pair of shoes last through another season. It is also likely that because of the longer period of their usefulness and the lesser importance of the style factor, durable goods are purchased less regularly than nondurables.

Another factor which would seem to contribute to the generally greater amplitude of cycles in stocks of durable goods is the sensitivity of their supply to changes in the political and economic climate. The outbreak of war or a prolonged strike in some basic industry such as steel would curtail the supply of many types of durable goods. Any likelihood of such an event, therefore, would tend to bring about an accumulation of durable goods inventories in excess of normal demand anticipations.

The decidedly greater amplitude of cyclical swings in the automotive series may be indicative of a greater tendency toward overselling and overoptimism on the part of automobile dealers than is generally true of other retail merchants. Overselling is said to result when large numbers of persons who do not customarily buy new cars every year have been persuaded to buy new models before they would normally have traded in their old ones. Such an acceleration in the rate of replacement in one year would tend to depress new car sales in following years, unless large numbers of buyers could be converted to a practice of replacing their old models more frequently.

In addition to overselling, heavy sales of automobiles are frequently made to persons who would be unable to purchase them except for the availability of credit on liberal terms. Any large volume of sales to such persons in one year would be tantamount to removing them from the market in the following year, or perhaps for several years, as they repay installment debts. Unless the effects of overselling or of heavy sales to persons dependent on easy credit terms could be forecast with some degree of accuracy, substantial inventory adjustments would be almost inevitable.

Because of the intense rivalry among automobile manufacturers, overselling, the use of installment credit as a competitive weapon, and a tendency toward overoptimistic forecasts are perhaps more typical of automobile dealers than of most other types of retailers.

Significance of the Findings

The known and suspected inadequacies of retail inventory statistics require that measures applied to them be interpreted with caution. But however one may be inclined to discount the results of these measurements, there are circumstances which invest cyclical movements in retail inventories with

far greater economic significance than the dimensions of the movements themselves would tend to imply.

Foremost among these circumstances is the location of retailers at the end of the channel of distribution. Any material shift in the general level of retail inventories will affect the flow of purchase orders moving back through this channel. As this flow of orders changes, so must manufacturers' inventory levels change and with them — depending on the magnitude of the inventory adjustment — their levels of production and employment. Moreover, the proverbial difficulty of forecasting shifts in consumer demand as well as the effect of these shifts on the flow of retail orders make all inventory levels tentative. As a result, changes in retail inventory levels occurring in a climate of pessimism or optimism may lead to unwarranted change in inventory investment at other distribution levels and hence to widespread inventory readjustments.

There is also a third condition which lends importance to change in retail inventories. This is the inability of many manufacturers to determine the extent of consumer acceptance of their products or the degree to which distribution channels may already be clogged with supplies of these products. Under such conditions, a manufacturer frequently does not know whether an increase in the flow of retail purchase orders, for example, means an increase in retail sales of his products or that retailers are building up inventories in anticipation of an increase in sales. An error in judgment either by retailers or by manufacturers can result in substantial inventory imbalance followed by equally substantial adjustments.

Given the only data available and statistical techniques which seem well adapted to these data, it seems reasonable to conclude that cyclical changes in retail inventories appear to be reasonably well defined in pattern and fairly impressive in magnitude. It also seems reasonable to conclude that conditions prevail which tend to transmit these changes with considerable impact to the general inventory situation and hence to the economic climate. Admittedly, these conclusions contribute little to a solution of the general problem posed by inventory fluctuations, but there is a possibility that they do bring one a little nearer to the core of the problem.

The Outlook for the Automobile Industry[1]

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PREDICTION, if it is to be anything more than guesswork, must be based upon an understanding of the past. By understanding the past we mean the uncovering of reliable behavior relationships among the variables of the past. Perhaps such relationships will hold in the future as well, and a prediction may be based upon them.

The future United States automobile demand is crucial, to the automobile industry itself as well as to the economy at large and the Western European exporters. But reliable relationships between the variables of the automobile market are difficult to uncover. To avoid disappointment it is important not to ask too much. The most modest question one may ask is perhaps what the "normal" size of the new-car market would be at this stage of the industry's development. The first part of this paper attempts to answer that question by setting up an equilibrium model of automobile demand. A much more demanding question would be, On which side of "normal" and how far from "normal" will we find ourselves in a particular year, say 1959? The second part of the paper tries to approach that problem by setting up what is called a disequilibrium model of automobile demand. A third part of the paper will discuss the small-car situation.

Equilibrium

Suppose we have a perfectly smoothly growing stock S of automobiles. Suppose, furthermore, that the useful life of an automobile has some distinct value, L years. Let the proportionate rate of growth of our automobile stock be g per annum. Then the demand x for new automobiles will consist of two components, that is, one which replaces the automobiles retired and one which makes the stock of automobiles grow.[2]

[1] This paper was read at the Sixth Annual Conference on the Economic Outlook at the University of Michigan, Ann Arbor, on November 4, 1958.

[2] The reader may at first sight question the realism of the notion that retired automobiles are replaced by new ones. But, ignoring the length of time that a used car spends on the dealer's used-car lot, we can say that when a new-car buyer trades in his used car, the latter will replace somebody else's still

Now, at any particular time in our perfectly smoothly growing automobile market, there exists an extremely simple value of the ratio between automobile demand and automobile stock, namely,

$$(1) \qquad \frac{x(t)}{S(t-1)} = \frac{g}{1-(1+g)^{-L}}$$

where $x(t)$ is automobile demand in period t, and $S(t-1)$ is automobile stock at time $t-1$. Period t is the period ending at time t. Equation (1) has been rigorously derived in the appendix at the end of this paper. The value of the ratio

$$\frac{x(t)}{S(t-1)}$$

as determined by (1) is called the equilibrium value of that ratio. It will exist only in a smoothly growing automobile market, and it is expressed in terms of two structural parameters, rate of growth g and useful life L. Table 1 tabulates the ratio (1) for alternative values of the structural parameters g and L.

Table 1. Values of the Ratio

$$\frac{g}{1-(1+g)^{-L}}$$

for Alternative Values of g and L

L \ g	0.045	0.050	0.055	0.060
8.....	0.1516	0.1547	0.1579	0.1610
9.....	.1376	.1407	.1438	.1470
10.....	.1264	.1295	.1327	.1359
11.....	.1172	.1204	.1236	.1268
12.....	.1097	.1128	.1160	.1193
13.....	.1033	.1065	.1097	.1130
14.....	.0978	.1010	.1043	.1076
15.....	.0931	.0963	.0996	.1030

Now what would be empirically plausible values of the parameters L and g? First L. The useful life of an automobile is an average covering a wide range of values. The only available clue to an empirically plausible value of L is the estimate by the Automobile Manufacturers Association of average age of cars when retired. It should be realized that useful life and average retirement age would coincide only if automobile stock remained stationary. If the stock is growing, cars retired while still young represent a more numerous generation than cars retired at a very old age. Consequently, excessive weight is given to the former at the expense of the latter, and useful life exceeds average retirement age. With this qualification in mind, we can use

older car which in turn will replace someone's still older car until finally a jalopy is junked.

Recently it has become fashionable to measure automobile stock in terms of dollars rather than in terms of number of cars, see e.g. Gregory C. Chow, *Demand for Automobiles in the United States* (Amsterdam: North-Holland Publishing Company, 1957); Robert A. Bandeen, "Automobile Consumption, 1940-1950," *Econometrica,* Vol. 25, No. 2 (April, 1957), pp. 239-48. Although the dollar value of automobile stock is an accurate measure of the capital cost (depreciation and interest) of automobile ownership, it is a poor measure of the maintenance and operation cost of the automobile. The latter item rises with the age of the automobile, whereas the former decreases rapidly with age. This consideration carries Wallander to the conclusion that for purposes of correlating the stock of cars with income, the number of cars is a better measure than dollars. Jan Wallander, *Studier i bilismens ekonomi* (Stockholm: Industriens utredningsinstitut, 1958), pp. 238-39. This book is perhaps the most penetrating analysis of the economics of motordom published in any country.

Table 2. Average Retirement Age in Years

t	L
1935	8.3
1941	10.2
1951	14.0
1952	14.3
1953	13.8
1954	13.2
1955	12.3
1956	11.1

Source: Automobile Manufacturers Association, *Automobile Facts and Figures*, recent editions (38th edition in proof).

the Automobile Manufacturers Association data on average retirement age, reproduced in Table 2. The general impression is that retirement age grew fairly smoothly from 8.3 years in 1935 to 14.3 years in 1952. However, wartime restrictions upon motor travel caused many cars to be placed in storage for the duration of the war, and the absence or scarcity of new cars in the market gave an inducement to maintain and service cars much better than was usually done. Generally speaking, then, late prewar cars played the role that would otherwise have been assumed by 1943 through 1945 models, had these existed. As the last prewar automobiles are now being scrapped, early postwar models will take their place in the oldest age bracket, and a reduction of average retirement age is occurring. This reduction is clearly visible in Table 2. All in all, a figure between 11 and 13 years would not seem implausible, but this is probably the lowest the industry can possibly hope for.

Table 3. Automobile Stock, New Car Demand, Disposable Income, and Rates of Increase of Disposable Income, 1949-57

t	S(t)[a]	x(t)[b]	Y(t)[c]	Y(t) − Y(t−1)[d]
1949	36.45	4.838	221.9	3.0
1950	40.33	6.326	240.5	18.6
1951	42.68	5.061	244.4	3.9
1952	43.82	4.158	250.9	6.5
1953	46.42	5.739	262.6	11.7
1954	48.46	5.535	265.9	3.3
1955	52.14	7.170	283.2	17.3
1956	54.20	5.955	296.7	13.5
1957	55.91	5.982	300.6	3.9

[a] Privately and publicly owned passenger cars excluding military vehicles in millions as of December 31, 1949-57. Source: Proofs of *Automobile Facts and Figures*, 38th edition (Detroit: Automobile Manufacturers Association, 1958).

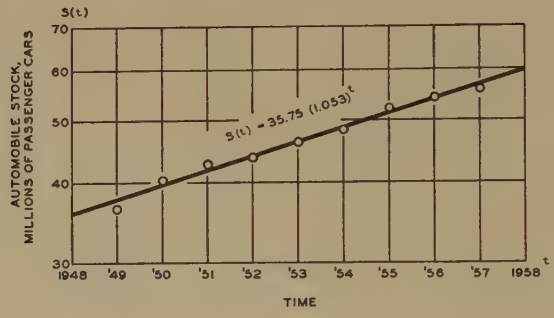
[b] New passenger car registrations in millions per year. Source: *Automotive News 1958 Almanac* (April 28, 1958), p. 44.

[c] Total disposable income in billions of dollars per year, 1957 prices. Source: *Economic Report of the President* (January, 1958) with the 1957 estimate replaced by Department of Commerce figure published in *Survey of Current Business*, May, 1958, p. S-1.

[d] Rate of increase of total disposable income, billions of dollars per year per year, 1957 prices. Source: Preceding column of Y(t) with the figure $218.9 billion added for the year 1948.

Our second structural parameter is g, the proportionate rate of growth of automobile stock. As for an empirically plausible value of g, the best we can do is to examine automobile stock statistics since 1949. Growth of automobile stock was abnormally low during the war and abnormally high between 1945 and 1949. The year 1949 marked the return of the buyer's market and will be the earliest year of time series used throughout this paper. Table 3 shows the stock of passenger cars in the

Chart 1



United States 1949-57. To find a proportionate rate of growth g for this period we must proceed as follows.

Assume automobile stock S to be the exponential function of time t:

$$S(t) = ab^t \tag{2}$$

where a and b are parameters to be determined. Take the logarithm on both sides of this equation and get $\log S(t) = \log a + t \log b$. Simple regression analysis will then determine the parameters as follows:

$$a = 35.75$$
$$b = 1.053$$

where S(t) is expressed in millions of cars, and where t equals 1, 2, . . . 9 representing the years 1949, 1950, . . . 1957. This means that the behavior of automobile stock over time may be approximated by a stock as of t = 0 (the year 1948) equaling 35.75 million cars, growing at an annual proportionate rate of growth of 0.053. The approximation is very good, the correlation coefficient being 0.992. The goodness of the approximation may also be seen from Chart 1.

Extrapolation to the Year 1959

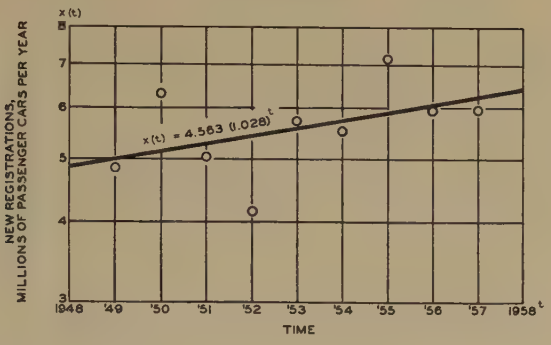
If the approximation is good it may be used for extrapolation purposes. The years 1949 through 1957 were called years 1 through 9. The year 1958 should be called, then, year 10. By inserting t = 10, a = 35.75, and b = 1.053 into equation (2) one gets S(t) = 59.89 million. The automobile stock as of December 31, 1958, should then be expected to be around 59.89 million cars. According to equation (1), in equilibrium it should be possible to calculate x(t) if S(t − 1) is known. Hence we can find equilibrium new-car demand x(1959) by multiplying equi

Table 4. Calculated New-Car Registrations for 1959
(Based on stocks)

L \ g	0.045	0.050	0.055
11	7.0191	7.2108	7.4024
12	6.5699	6.7556	6.9472
13	6.1866	6.3782	6.5699
14	5.8572	6.0489	6.2465

Note: Calculated according to Table 1 assuming auto stock to be 59.89 million cars on December 31, 1958.

Chart 2



librium automobile stock S(1958) by the values of Table 1. This has been done in Table 4 for selected values. The table shows, for example, that if useful life is assumed to be 12 years and the equilibrium rate of growth is assumed to be 0.050, then equilibrium new-car demand in 1959 would be 6.7556 million cars.

This method is extremely crude. But the author takes a certain pride in it, because in 1955 it permitted him to see the then current new-car demand as far above normal for 1955.[3] Also, as we shall now see, more refined methods will yield a forecast which is close to our 6.7556 million.

Disequilibrium

Until now it has been assumed that the structural parameters L and g are constant. But what if the structural parameters are themselves subject to change over time? In fact, they are; we have already seen that over the decades, passenger cars seem to have increasing longevity. If such changes are slow and numerically small, our equilibrium analysis is still a good first approximation. But if the changes are abrupt and large — as they may well be in the short run — our equilibrium analysis will merely indicate a normal level of new-car demand from which we are moving away and another normal level toward which we are moving, but it will tell us nothing about the path to be followed between the two.

Whether we imagine changes in the useful life or changes in the growth rate, lasting marks will have been left on the market in the form of an uneven age distribution, that is, a distribution which differs from the one that would exist in a smoothly growing stock. This is a third reason, besides the possible initial changes in L and g, why our equilibrium analysis will not give us a good demand forecast for any particular year, except by pure accident.

[3] Hans Brems, "Long-Run Automobile Demand," *Journal of Marketing*, Vol. 20, No. 4 (April, 1956), pp. 379-84; and Hans Brems, "Recenti sviluppi della consistenza e struttura della domanda di autovetture negli Stati Uniti," *Automobilismo Industriale*, No. 18 (Anno IV, Gennaio-Febbraio, 1956), pp. 33-39.

We should not be surprised, then, to find that new-car demand does *not* display smooth growth. The magnitude of its fluctuations is seen from Chart 2. If an attempt is made to represent new-car demand $x(t)$ as an exponential function of time t, similarly to what we did for $S(t)$, we shall find

$$x(t) = cd^t \tag{3}$$

where

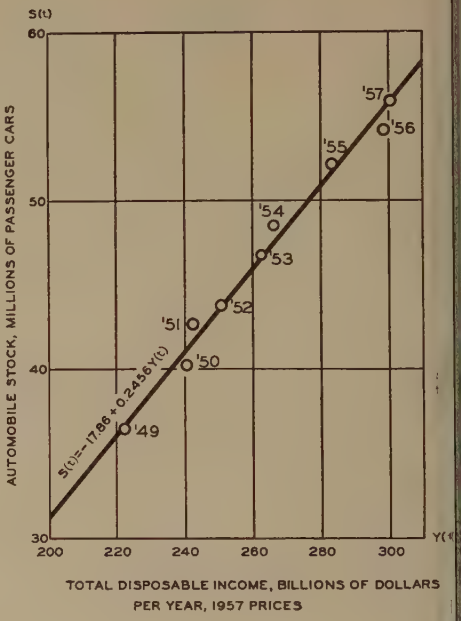
$$c = 4.863$$
$$d = 1.028$$

and where $x(t)$ is expressed in millions of cars per year. The approximation is poor, indeed. The correlation coefficient is merely 0.470. In addition it must arouse suspicion that while according to (2) the proportionate rate of growth of $S(t)$ was 0.053, according to (3) the proportionate rate of growth of $x(t)$ is little over half as much, i.e. 0.028. In equilibrium, as we know, since there is a constant proportion between demand and stock, both would be growing at the same proportionate rate.

Stock Explained by Level of Disposable Income

Using time for the independent variable can only be a first approximation to the problem. As the second step let us try to explain automobile stock in terms of something else than time. The most obvious independent variable would be disposable real income $Y(t)$. If simple correlation is applied to the relationship between $S(t)$ and $Y(t)$, one will get

Chart 3



$$S(t) = -17.86 + 0.2456\,Y(t) \tag{4}$$

where $S(t)$ is expressed in millions of cars, and $Y(t)$ in billions of dollars 1957 prices. Chart 3 shows how successful the correlation is. The correlation coefficient is 0.996, as good as the correlation coefficient for equation (2). We should expect, then, that for every billion dollars' worth of additional disposable real income, automobile stock should rise by 245,600 cars.

Alternative Explanations of New-Car Demand

The last statement may be a clue to new-car demand. Increase in automobile stock equals new-car demand minus scrappage. So as the third step let us try to explain new-car demand in terms of rate of increase in dispos

Chart 4

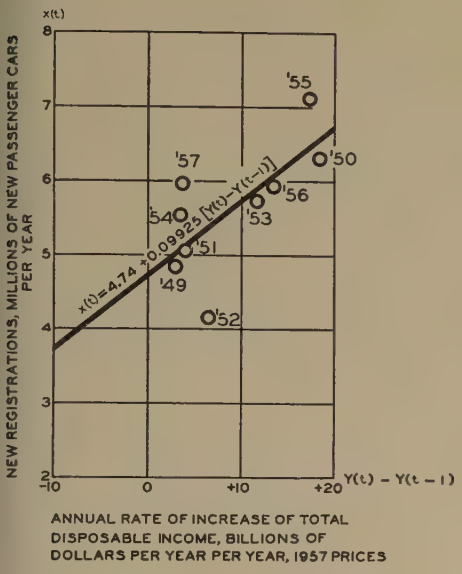
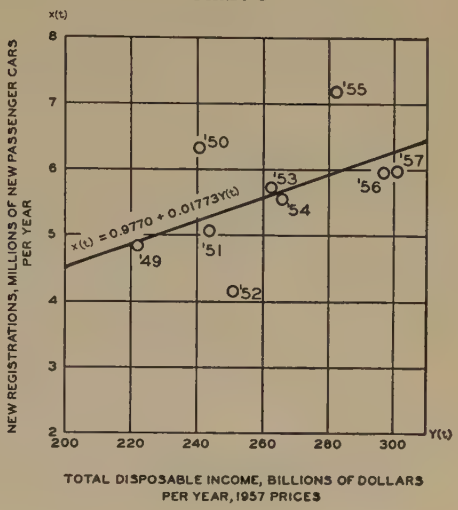


Chart 5



able real income. If simple correlation is applied one will get

$$(5) \quad x(t) = +4.739 + 0.09925\,[Y(t) - Y(t-1)]$$

where $x(t)$ is expressed in millions of cars per year, and $Y(t) - Y(t-1)$ is expressed in billions of dollars per year *per year,* 1957 prices. Chart 4 shows that this correlation is less successful. The correlation coefficient is 0.706. Clearly, then, there is room for improvement.

On a priori grounds one might expect the level of income to affect automobile demand no less than did the rate of increase of income. The level may be said to determine the extent to which motorists can currently "afford" a new car, the rate of increase, positive or negative, may be said to determine their optimism or pessimism with respect to future income levels. As the fourth step let us try to explain new-car demand in terms of level of disposable real income. Simple correlation gives us

$$(6) \quad x(t) = +0.9770 + 0.01773\,Y(t)$$

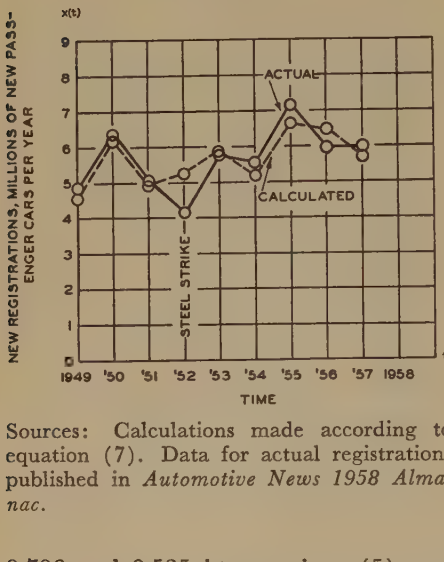
where $x(t)$ and $Y(t)$ have the usual dimensions. Chart 5 shows that this correlation is even less successful than (5). The correlation coefficient is 0.535. There is still room for improvement.

Replacing simple by multiple correlation we may explain new-car demand as

$$(7) \quad x(t) = +1.265 + 0.01361\,Y(t) + 0.08778\,[Y(t) - Y(t-1)]$$

where $x(t)$, $Y(t)$, and $Y(t) - Y(t-1)$ have the usual dimensions. Multiple correlation is superior to simple correlation: The multiple correlation coefficient in equation (7) is 0.813 versus

Chart 6



Sources: Calculations made according to equation (7). Data for actual registrations published in *Automotive News 1958 Almanac.*

0.706 and 0.535 in equations (5) and (6) respectively. To see how good the approximation offered by equation (7) is, let us calculate x(t) from (7) for each of the years 1949 through 1957 and compare the result with the actual figures from Table 3.

This is shown in Chart 6. The one year for which equation (7) gives a very poor approximation is 1952. But the steel strike in the summer of 1952 paralyzed automobile production, and new cars were unavailable in the early fall of 1952. The actual figure, then, should indeed fall considerably short of the calculated figure 5.249 for the year 1952. For the year 1955 the actual figure is somewhat higher than the calculated figure 6.638. Indeed, some of the sales rightly belonging to 1956 seem to have been pulled backward into 1955. Perhaps this discrepancy is best explained by two variables not represented in equation (7). First, the unusually radical model shifts taking place in 1955; Chevrolet and Plymouth both had their first V8 engines and both had new body shells. Second, the average duration of the credit contract was substantially lengthened in that year. Suits[4] is the first writer to include this variable in his explanation of automobile demand. His variable was retail price divided by the average duration of the credit contracts, and he found this variable a significant one.

Testing Equation (7) on the Year 1958

Does equation (7) stand up equally well if applied to the current year? By now it should be possible to establish the order of magnitude of both disposable income and automobile registrations for 1958. First disposable income. Unfortunately, for our purposes the Department of Commerce last July announced a new series of disposable income estimates which are slightly higher than the ones used up to July 1958. More precisely they seem to run about $5 billion higher than the old series for the same quarters. The latest available[5] figure in the new series is $307.5 billion for June, 1958, equivalent to about $302.5 billion in the old series. From June, 1957, to June, 1958 however, the consumer price index with

[4] Daniel B. Suits, "The Demand For New Automobiles in the United States, 1929-1956," *Review of Economics and Statistics* Vol. 40, No. 3 (August, 1958), pp. 273-80.

[5] The present paper was finished in early October, 1958.

1947-49 = 100 went up from 120.2 to 123.7. Hence $302.5 billion in 1958 prices would be equivalent to $293.9 billion in 1957 prices. Set Y(1958) equal to $293.9 billion. Y(1958) — Y(1957) is, then, —$6.7 billion. If these two values are inserted into equation (7), x(1958) turns out to be 4.677 million cars. This is close to what is likely to be the actual new-car registrations for 1958, i.e. around four and a half million. Essentially, then, the exceptionally low registrations in 1958 may be explained by income and its variation.

Extrapolating to the Year 1959

Since equation (7) seems capable of explaining 1958 quite well, it might be applied to the year 1959. Nobody knows what disposable income will be in 1959. But currently, disposable money income is rising at a substantial rate, and prices do not seem to be rising correspondingly. Will disposable income in 1957 prices be $10 billion, $15 billion, or $20 billion higher in 1959? Others are better qualified to give the answer, so let us merely use the three alternatives as possibilities and insert them in equation (7). Table 5 shows that the three alternatives will give us a new-car demand of 6.3, 6.8, or 7.3 million cars respectively. If it is agreed that disposable income for 1959 in 1957 prices is unlikely to be less than $10 billion higher than the 1958 figure, then new-car registrations are unlikely to be less than six million cars and may well be substantially higher. Indeed we may be heading for another 1955!

Table 5. Calculated New-Car Registrations for 1959
(Based on income)

Y(1959)	Y(1959) — Y(1958)	x(1959)
303.9	10.0	6.279
308.9	15.0	6.786
313.9	20.0	7.293

Note: Calculated according to equation (7), assuming disposable income for 1958 to be $293.9 billion (old series, 1957 prices).

While the writer is optimistic so far as the total new-car registrations are concerned, he is much less optimistic about Michigan's share of these registrations. He would expect Wisconsin and Europe to increase their shares further, for reasons now to be set out.

Is Detroit Offering an Obsolete Product?

With each new body shell the major automobile producers have traditionally been offering longer and longer cars. For example, during the period 1948-58 over-all length has increased as follows:

Chevrolet . . . . 11.5 inches
Ford . . . . . 10.7 inches
Plymouth . . . . 9.5 inches

For 1959, further increases in over-all length are taking place. Chevrolet has a new longer body, Ford is dropping the shorter Custom 300 and concentrating on the longer Fairlane. Plymouth is unchanged.

Simultaneously, over-all height has

been reduced from 60 and 61 inches as late as 1955 to a uniform 57 inches in 1958 models of Chevrolet, Ford, and Plymouth. In accomplishing this, the major producers have taken no steps to alter basic designs. There are no engines in the rear and no fixed driveshafts with single-joint swinging rear axles. There is not even the adoption of the integral body and frame. Instead, existing frames have simply been modified in shape, resulting in reduced structural rigidity. The driveshaft hump has been increased to the point where the huge average 1958 model is virtually a four-passenger car with none of the four being particularly comfortable. In this situation the question must be raised whether or not the major producers can maintain their share of the market.

The Small-Car Situation

What is a small car? If small cars are defined as anything having a wheelbase less than or equal to 108 inches, they form a very distinct segment of the market with practically nothing between them and the 118-inch wheelbase Chevrolet, Ford Fairlane, and Plymouth. The last Willys produced, the current Rambler four-door models, and the largest cars imported in substantial quantities, i.e. the 3.4 litre Jaguar and the Mercedes-Benz 219, all happen to have a 108-inch wheelbase. The Mercedes-Benz 180 has a 105-inch wheelbase.

Table 6 and Chart 7 show new small-car registrations as a percentage of all new-car registrations since 1950. Small car registrations have risen from less than 2 percent to more than 10 percent of the market. The first half of the period since 1950 is characterized by the failures such as Crosley, Henry J, Hudson Jet, and Willys. The last half of the period is characterized by the remarkable success of the Rambler and the imports. Their combined percentage doubled from 1956 to 1957 and doubled once again from 1957 to the *first half of* 1958!

There is, of course, not the slightest reason to believe that the percentage will stay put around 10. First, we have already seen that no domestic 1959 model offered by the major producers is any smaller than its 1958 equivalent; quite the contrary. Second, in many parts of the country, foreign cars are not offered and are not yet well known. Third, General Motors has yet to reveal to the United States its outstanding European six-cylinder models, the Vauxhall *Cresta* and the Opel *Kapitän*.[6] Fourth, even in metropolitan areas, where foreign cars are actually retailed, the most popular of them, the Volkswagen, is available only with substantially delayed delivery. Fifth, high market values of second-hand Volks-

[6] The Opel *Kapitän* is a US-styled German-built 110-inch wheelbase overhead valve six-cylinder four-door sedan with integral body and frame. Its front seats are separate and reclining, and fold into beds. It has been praised by the highly critical European reviewers for its comfort and solidity. Does General Motors consider its American customers too immature to be exposed to this Rambler-like product?

Table 6. New Small-Car Registrations as a Percentage of All New-Car Registrations, 1950-58

	1950	1951	1952	1953	1954	1955	1956	1957	1958 (first half)
Allstate	....	....	0.05	0.02	....	....	....	....	....
Crosley	0.11	0.10	0.07	....	....	....	....	....	....
Foreign makes	0.25	0.41	0.70	0.51	0.45	0.73	1.53	3.26	6.73
Henry J	0.22	1.01	0.70	0.19	0.02	....	....	....	....
Hudson Jet	....	....	....	0.30	0.18	....	....	....	....
Rambler	0.22	0.91	1.23	0.70	0.65	1.05	1.19	1.53	3.32
Willys	0.54	0.51	0.99	0.73	0.31	0.08	....	....	....
Total	1.34	2.94	3.74	2.45	1.61	1.86	2.72	4.79	10.05

Source: *Automotive News.*

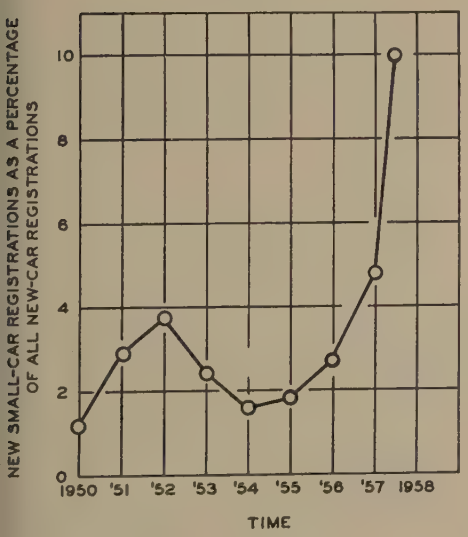
wagens and Ramblers are symptoms of an as yet unsaturated market.

The Price Factor

It has always been difficult to measure the price elasticity of demand for automobiles in general. Roos and von Szeliski[7] found it to be −1.5, and Atkinson[8] found it to be −1.31. It has been even more difficult to measure the price elasticity of demand for a particular make of car. For the period 1932-50 the present writer[9] found that a 1 percent increase in the Ford-Chevrolet price ratio would result in a 1.79 percent decline in the Ford-Chevrolet new-registrations ratio. On the whole it is fair to say that findings have been few and inconclusive.

The reason for this is not difficult to see. A variable such as price may be highly significant for demand. Yet if it does not vary at all or does not vary enough, statistical analysis cannot estab-

Chart 7



Source: *Automotive News.*

[7] C. F. Roos and Victor von Szeliski, *The Dynamics of Automobile Demand* (Detroit: General Motors Corporation, 1939).

[8] L. Jay Atkinson, "Demand for Consumer Durable Goods," *Survey of Current Business,* June, 1950.

[9] Hans Brems, *Product Equilibrium Under Monopolistic Competition* (Cambridge: Harvard University Press, 1951), pp. 45-46.

lish its significance. Such has been the case with price over time, and the statistical studies mentioned have all used the time-series approach. An alternative in the form of, say, geographical cross-section analysis was not available for the simple reason that all domestic products are produced in the Great Lakes region. Price differentials between them differing from one state to another could not exist.

The rise of imports has changed this. Imports are priced F.O.B. port of entry, and the freight item is roughly in proportion to the distance of the point of delivery from the nearest port of entry. In the small-car market the effects of this are quite noticeable. The only close domestic substitute for the imports is the Rambler, whose price will include a freight item which is roughly in proportion to the distance of the point of delivery from the Wisconsin plants of American Motors. Consequently, the Rambler-import price ratio is high on the coasts but low in the Midwest. One should expect, then, the Rambler-import new registrations ratio to be low on the coasts and high in the Midwest. Such is precisely the case. Call that ratio r and think of r as a function of the distance m from Wisconsin. Choose the fourteen leading wealthy states with large metropolitan agglomerations (only in such areas are foreign cars as yet offered). Let

$$r = em^f \tag{8}$$

where e and f are parameters to be determined. Take the logarithm on both sides and get $\log r = \log e + f \log m$. Simple regression analysis will determine the parameters as follows:

$$e = +3.641$$
$$f = -0.2798$$

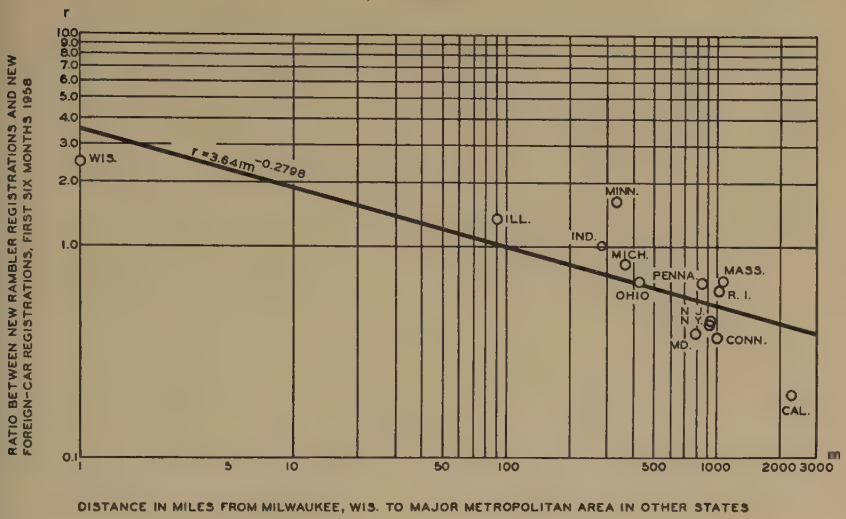
where r is the pure number indicating the ratio between new Rambler registrations and new foreign-car registrations during the first six months of 1958, and where m is the distance in miles between Wisconsin and the largest metropolitan agglomeration of each of the fourteen states.

Chart 8 shows the regression line representing equation (8). The correlation is quite successful; the correlation coefficient is 0.803. In conclusion we may say that the small-car market is quite sensitive to price. After all, Rambler sales in California are merely one-fifth of imports, whereas they are two and a half times imports in Wisconsin. Other factors admittedly may be at work. Californians are perhaps more internationalist than Midwesterners. But it is difficult to believe that price is not a major factor.

Conclusions

The conclusions drawn in this paper are threefold. First, if disposable income for 1959 in 1957 prices should be $10 billion, $15 billion, or $20 billion higher than for 1958, then 1959 new-car demand should be about 6.3, 6.8, or 7.3 million cars, respectively. Second, the small cars built in Wiscon-

Chart 8



sin and in Western Europe are likely to expand their share of the market beyond the current 10 percent. Third, the price sensitivity in the increasingly important small-car market is probably quite high. Such sensitivity, if it exists, should be of interest to the major producers if and when they decide to offer a domestically produced small car.

APPENDIX

Let number of new automobiles sold during period t be $x(t)$; let stock of automobiles in operation at time t be $S(t)$. Let number of used automobiles retired during period t be $r(t)$. The change in stock from time $t-1$ to time t will then be the difference between number of new automobiles sold and number of used automobiles retired, or

$$(9) \quad S(t) - S(t-1) = x(t) - r(t)$$

But in a perfectly smoothly growing stock growing at the proportionate rate of growth g we have

$$(10) \quad S(t) = (1+g)\,S(t-1)$$

And if the useful life of an automobile is L periods, then the number of used automobiles retired during period t equals the number of new automobiles sold during period $t - L$, or

$$(11) \quad r(t) = x(t-L)$$

Taking (9), (10), and (11) together we have

$$(12) \quad x(t) = gS(t-1) + x(t-L)$$

and replacing t by $t-L$ in (12) gives us

$$(12a) \quad x(t-L) = gS(t-L-1) + x(t-2L)$$

Inserting (12a) into (12) gives us

$$\begin{aligned} x(t) &= gS(t-1) + gS(t-L-1) + x(t-2L) \\ &= gS(t-1)\left[1 + (1+g)^{-L}\right] + x(t-2L) \end{aligned}$$

In this way, we can keep on going back L periods at a time n times. Then, we get

$$x(t) = gS(t-1)\left[1 + (1+g)^{-L} + \ldots + (1+g)^{-nL}\right] + r(t-nL)$$

Use the rule for finding the sum of the first n terms of a geometric progression, let n approach infinity, divide on both sides by $S(t-1)$ and get formula (1) in the text:

$$(1) \qquad \frac{x(t)}{S(t-1)} = \frac{g}{1-(1+g)^{-L}}$$

Some Facts About the Canadian Exchange Rate[1]

LELAND B. YEAGER

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SELDOM IF EVER does a single historical episode confirm or refute supposed economic principles; too many extraneous influences obscure the relations under study. For example, the Canadian experience with a pegged exchange rate before and a freely fluctuating rate since October, 1950, might be expected to shed light on disputed aspects of the rival systems in general: Under which system are balance-of-payments crises less likely to occur? Under which system is disruptive speculation less likely? Are fluctuations of a free rate likely to be wild and haphazard either because of speculation or because of low demand elasticities in international trade? Do fluctuations tend on balance to impede international trade and investment? Any apparent answers to these questions, however, could always be argued away by reference to special historical circumstances such as the sharing of a common name by the Canadian and American currencies, the strength of the Canadian economy and its close relations with the American economy, the continuance of rate pegging and exchange controls in most countries outside Canada, and conditions arising from the Korean and "cold" wars. The facts offered here cannot, therefore, give final answers to general questions about fluctuating exchange rates; they are only one contribution to the hoped-for accretion of evidence from various countries at various times that, together with theory, may eventually yield reasonably reliable answers.

[1] The author is indebted to Daniel J. Edwards, Harvey Wheeler, and Jack Mester for assistance with many of the computations used in this paper.

The Pegged-Rate Background

Canada adopted a fluctuating exchange rate in 1950 after having considerable trouble with its pegged-rate system since World War II. During 1945 and the first half of 1946, a strengthening opinion that the Canadian dollar was undervalued at its wartime rate of 90.9 US cents led Americans to buy Canadian securities heavily, while Canadians cut their holdings of American securities. The attendant build-up in official Canadian holdings of US dollars, together with hopes of checking the contagion of American price inflation, led the Canadian gov-

ernment to restore its dollar to parity with the US dollar in July, 1946.

This revaluation soon proved to be a mistake. Canada developed unprecedentedly large current-account deficits in her transactions with the United States. As one Canadian economist said, "The cause of the 1947 crisis in foreign exchange was that Canada overreached herself. We tried to consume, invest at home, and lend abroad more than we produced."[2] Official Canadian reserves of gold and US dollars fell from US$1,667 million in May, 1946, to only US$480 million in November, 1947[3]—a rate of loss that, if continued, would have wiped out the remaining reserve by the early summer of 1948. In place of devaluation to meet the crisis, severe restrictions on imports from and travel in the United States and other hard-currency countries were inaugurated in November, 1947. Canada also cut its foreign lending and got a loan from the United States Export-Import Bank. Though the program stemmed the crisis, the continuing deficit with the United States still was not satisfactorily met by inconvertible pounds earned in trade with Great Britain. In the summer of 1949 (a year of American recession), Canada's Acting Prime Minister warned that tightened austerity restrictions might again be necessary. And when the worldwide devaluations of September, 1949, threatened Canadian exports with intensified competition, Canada responded with a 10 percent devaluation against the United States dollar.

Many people felt that the Canadian dollar was now undervalued. Expectations of revaluation crystallized rapidly under the influence of the Korean War boom in raw materials, intensified exploration and development of Canadian natural resources, and external inflationary pressures resembling those that had led to the revaluation of 1946. Rumors gained support from the Commerce Minister's statement in Parliament on June 5, 1950, that the discount on the Canadian dollar could not last much longer.[4] Of the C$960 million net capital inflow in 1950, only about C$240 million was for direct long-term investment; most of the remainder represented speculation.[5] Foreigners acquired Canadian bank notes, bank deposits, and government and corporation securities, either for cash or on margin. The item "other capital movements" in the Canadian balance of payments swelled tremendously: many American companies with Canadian affiliates delayed taking their profits out of Canada and delayed payments for things bought in the United States for use in Canada; foreigners due to receive payments in Canadian dollars were glad to wait and Canadians due

[2] Harry C. Eastman, "A Comment on Canadian Post-War Monetary Policy," *Canadian Journal of Economics and Political Science,* Vol. 21 (August, 1955), p. 364.

[3] Figures on official reserves cited here and elsewhere in this paper are published monthly in Bank of Canada, *Statistical Summary,* and in the annual supplements.

[4] Samuel I. Katz, "Le dollar canadien et le cours de change fluctuant," *Bulletin d'Information et de Documentation de la Banque Nationale de Belgique,* 30th year, Vol. I (May, 1955), p. 3.

[5] Samuel I. Katz, "The Canadian Dollar: A Fluctuating Currency," *Review of Economics and Statistics,* Vol. 35 (August, 1953), pp. 236-37.

to make payments in foreign currencies were anxious to delay.

The fixed exchange rate forced the Foreign Exchange Control Board to meet this speculative capital inflow by buying — at a 10 percent premium in terms of Canadian dollars — all US dollars offered. Official Canadian holdings of gold and US dollars thus rose from US$1,117 million at the end of December, 1949, to US$1,255 million at the end of June, 1950, and by a further 43 percent in the third quarter of 1950 alone, to US$1,790 million at the end of September. The monthly increases amounted to US$73 million in June, US$65 million in July, US$184 million in August, and US$285 million in September. The sharp peak for September dramatizes the snowballing speculation.

Finding the Canadian dollars to buy the foreign exchange offered to the Foreign Exchange Control Board became a serious problem. The government had to supplement funds from its budget surplus by borrowing from the chartered (commercial) banks and by turning to the Bank of Canada for help in absorbing foreign exchange. Like a giant open-market operation, these purchases of foreign exchange provided the chartered banks with reserves and the public with Canadian funds and so tended to feed inflation. The Bank of Canada tried to offset these inflationary effects by selling government securities on the open market. As the Governor of the Bank later told a parliamentary committee, these sales, relative to the size of the Canadian economy, constituted the largest open-market operation in the history of central banks. Still, they did not suffice to keep the reserves of the chartered banks from rising during 1950.

Toward the end of September, 1950, official holdings of gold and US dollars had climbed to nearly US$1.8 billion. Announcement of this figure, due early in October, was sure to spur speculation still more as long as the Canadian dollar stayed pegged at 90.9 US cents. In the words of the Finance Minister,

> there is no telling how much further this movement might have gone so long as the fixed rate of a 10% premium on U.S. dollars was maintained and people believed in the possibility or probability of an official change to another fixed rate such as parity.

The Minister went on to say that

> an influx of funds on this tremendous scale would, if continued, be likely to exercise an inflationary influence in Canada at a time when government policy in all fields is directed to combatting inflationary developments.[6]

Something had to be done. But what? Raising the Canadian dollar to parity with the American dollar would probably have reversed the capital movement as speculators took their profits at the expense of the Canadian authorities. The Finance Minister emphasized that adoption of parity or any other fixed rate "would not necessarily be justified by fundamental conditions and might be found to require reversal or further adjustment within the not too distant future."[7] Emerging weakness in trade and service items in the Canadian balance of payments in-

[6] Bank of Nova Scotia, *Monthly Review*, September, 1950, p. 4.

[7] Raymond F. Mikesell, *Foreign Exchange in The Postwar World* (New York: Twentieth Century Fund, 1954), p. 162.

creased the delicacy of the problem. All alternatives being open to serious objection, Finance Minister Abbott persuaded the cabinet, despite the principles of the International Monetary Fund, to try a fluctuating exchange rate.

The Canadian authorities announced their surprise decision at a meeting of bankers in Ottawa on Saturday morning, September 30, 1950.[8] The chartered banks reshuffled their personnel, established exchange trading departments, and installed extra telephones over the weekend and were able to inaugurate the free market on Monday morning, October 2.

The immediate results were gratifying. Though American investment funds kept moving into Canada, the heavy speculative inflow ceased without giving way to a speculative outflow. For a while Canada kept its general structure of control over international transactions (though not over the exchange rate itself). Finally, after fourteen months of progressive relaxation, exchange controls were suddenly and completely abolished on December 14, 1951. Canada then notified the International Monetary Fund and so became the first member country that had imposed exchange controls during and after World War II to give up the "transition period" excuse for them. These results contrast with the unsatisfactory conditions under the earlier pegged rate that had led to upward revaluation of the Canadian dollar in July, 1946, to a tightening of trade and exchange controls in the fall of 1947, to the devaluation of September, 1949, and finally to abandonment of rate pegging at the end of September, 1950.

Fluctuations

The free Canadian dollar was first quoted at about 93.5 US cents. It reached parity with the American dollar on January 22, 1952, and since then, apart from a few brief dips to parity late in 1955, has been at a premium. In the entire free-rate period, the Canadian dollar has fluctuated in a range of more than 13 US cents, reaching a low of 93 cents in October, 1950 (the first month of free rates), and a brief high of nearly 106.2 cents in August, 1957. Much of this fluctuation can readily be explained by "objective" economic conditions. An obvious first thought is to stress the state of Canada's international balance on current account. By expressing current receipts as a percentage of current payments and correlating this figure with the average US rate on the Canadian dollar[9] for the 27 quarters from the fourth quarter of 1950 through the second quarter of 1957, we get a coefficient of +0.01. Some such insignificant result was to have been expected, for the state of the balance of payments is an effect as well as a cause of the exchange rate; the problem here is akin to the well-known "identification problem" in statistically deriving demand or supply

[8] The *Financial Post*, in its last issue before the announcement (September 30, p. 2) had characterized "reports of imminent revaluation" as "completely unfounded."

[9] For the receipts-payments ratio, see the appendix table at the end of this article. Average exchange rates were computed from the monthly figures given in the *Federal Reserve Bulletin*.

curves for individual commodities. A more reasonable correlation is between the 27 quarterly averages of the actual exchange rate and the purchasing-power-parity exchange rate calculated with United States and Canadian wholesale price indexes; another is between the 26 quarterly figures for the first quarter of 1951 through the second of 1957 of the actual exchange rate expressed as a percentage of its level in the preceding quarter and the wholesale-parity rate similarly expressed (or what amounts to the same thing, the percentage change from the preceding quarter in the ratio of the US to the Canadian price index). These two results were +0.83 and +0.64 respectively (both significant at the .01 level, if the usual tests are thought applicable).[10] This detectable apparent relation between short-run exchange-rate and price movements is remarkable, especially considering the narrow range of fluctuation of the relevant variables in the Canadian experience. Interest rates seem to have played a role also. The quarterly average excess of Canadian over American long-term interest rates correlates to the extent of +0.59 with the percentage deviations of actual from wholesale-purchasing-power-parity exchange rates for the 27 quarters from the fourth quarter of 1950 through the second quarter of 1957. The actual exchange rate shows a correlation of +0.61 with the excess of Canadian over American Treasury bill rates for the 27 quarters.[11]

If the well-known theories about perversely low price elasticities of demand in international trade were applicable to Canada, or if seriously destabilizing speculation had taken place, the exchange rate would be expected to display extreme short-run fluctuations. Yet short-run fluctuations seem to have been mild and orderly. Very rarely, for example, has the Canadian dollar fluctuated as much as a full US cent during a single day. Samuel I. Katz studied the New York quotations for each market day during 1955 and found that the high and low diverged by one-fourth of a cent or less on 223 days and by more than one-fourth of a cent on

[10] See the appendix table for the underlying figures. The base chosen for calculating comparative-version purchasing-power-parities was the average of the whole period October, 1950, through June, 1957; thus actual and parity exchange rates have the same average over the whole period. This procedure, though useless in studying any correspondence between exchange-rate and relative-price movements since some time years ago, is useful in studying the correspondence within the short period covered. In the correlation of quarterly figures expressed as percentages of their previous quarterly average, the last quarter of 1950 was left out because including it would have involved the previous quarter, before the exchange rate had been freed. The correlation coefficients corresponding in all respects to the two given in the text above except for use of consumer rather than wholesale price indexes were +0.18 and +0.14 respectively, perhaps reflecting the less prompt response of retail prices to monetary conditions, as well as the extremely narrow range within which the ratio of US to Canadian consumer prices has fluctuated. The general question whether causation runs more strongly from prices to exchange rates or from exchange rates to prices is explored in "A Rehabilitation of Purchasing-Power Parity," to be published in the *Journal of Political Economy*.

[11] See the appendix table for the long-term interest-rate spread. Treasury bill rates were taken from the Bank of Canada's *Statistical Summary* and from the *Federal Reserve Bulletin*.

only 26 days; the average daily high-low spread was only 0.07 of a cent.[12] Daily fluctuations of the free Canadian dollar in US cents were actually smaller than those of the pegged British pound — but of course the pound is a larger unit. Even within months and years the spread between highest and lowest quotations has been small. Of the 87 months of free rates experienced through 1957, only four — October, 1950; December, 1951; November, 1952; and February, 1955 — had a high-low spread of more than 2 US cents. The greatest of these, 2.75 cents, occurred during the very first month of free rates. The monthly spread exceeded 1.5 cents in only 10 months and reached 1 cent or more in only 30 months, or barely over one-third of the time. It was .75 of a cent or less in 46 months, or over half the time, and .5 of a cent or less in 21 months, or almost one-fourth of the time. The average spread within months over the whole period was only 0.866 of a US cent. The spread between each *year's* highest and lowest daily rates, expressed as a percentage of the mid-point of the range, was 5.1 in 1951, 5.2 in 1952, 2.7 in 1953, 2.4 in 1954, 3.5 in 1955, 4.4 in 1956, and 4.6 in 1957.[13]

[12] *Two Approaches to the Exchange-Rate Problem: The United Kingdom and Canada,* Essays in International Finance, No. 26 (Princeton: Princeton University, Department of Economics and Sociology, International Finance Section, 1956), p. 6. A preliminary mimeographed version of Mr. Katz's study mentions that a spread of over one-half cent occurred on only four days.

[13] Derived from the exchange-rate table published early each January in the *New York Times.*

Official Intervention in the Free Market

The extent to which credit for this record of orderliness belongs to the Exchange Fund Account, managed by the Bank of Canada, and the extent to which the record would have been either worse or better in the Fund's absence, is a large topic in itself; and a full treatment would be beyond the scope of this paper.[14] For comparison, however, it may be worth citing the Austrian gulden, which fluctuated freely without systematic official intervention after losing contact with its traditional silver basis in 1879 and until the first moves toward a gold-exchange standard in 1892. The spread between the year's highest and lowest Vienna quotations on London, expressed as a percentage of the year's average rate, was 1.96 in 1879, 2.12 in 1880, 1.91 in 1881, 2.04 in 1882, 1.30 in 1883, 2.17 in 1884, 2.48 in 1885, 1.82 in 1886, 3.23 in 1887, 5.56 in 1888, 3.88 in 1889, 7.41 in 1890, and 4.36 in 1891.[15]

Canadian authorities have repeatedly stated that the exchange rate is allowed to move in response to the normal play of economic forces; the Exchange Fund makes no attempt to resist persistent

[14] Cf. Harry C. Eastman and Stefan Stykolt, "Exchange Stabilization in Canada, 1950-4," *Canadian Journal of Economics and Political Science,* Vol. 22 (May, 1956), pp. 221-33; and Sidney Turk, "Foreign Exchange Market in Canada," *Canadian Chartered Accountant,* Vol. 63 (August, 1953), pp. 58-68.

[15] Derived from Austria-Hungary, Finance Ministry, *Statistische Tabellen zur Währungs-Frage der Österreichisch-Ungarischen Monarchie* (Vienna: K. K. Hof- und Staatsdruckerei, 1892), pp. 216-17.

trends and deals in the market only to resist whatever excessive short-run wobbles might otherwise occur.[16] Details of the fund's operations are not made public, for obvious reasons; but some clues may be gleaned from the published figures on official Canadian holdings of gold and US dollars at the end of each month. It does appear that the announced policy is followed and that the fund's influence is indeed peripheral. Over the entire period from the fourth quarter of 1950 through the first half of 1957, net quarterly balances met by changes in official reserves of gold and foreign exchange (disregarding direction of change) averaged C$45.0 million, in comparison with quarterly average balance-of-payments credits and debits of all other types (except mutual aid to NATO countries) of C$1,707.2 million and C$1,705.5 million respectively. Over the same period, net monthly changes in official gold-and-American-dollar reserves averaged US$19.9 million, in comparison with monthly average current-account credits and debits in the balance of payments (not including mutual aid to NATO countries) of C$474.6 million and C$528.8 million respectively.[17] In the same 81-month period, net monthly changes in official reserves did not exceed US$20 million in a full two-thirds of the months. The net change was between US$20 million and US$40 million in another sixteen months and in excess of US$100 million in only one month (August, 1951, with a change of US$106.9 million).

The mildness of Exchange Fund activity since October, 1950, contrasts with heavy activity earlier. Reserves have undergone much smaller net quarterly and monthly changes since adoption of the free rate than before, despite three important facts. First, the volume of Canada's international transactions has expanded greatly; this might have been expected — barring the benefits of a free exchange rate — to increase the surpluses and deficits requiring official offsetting. Second, exchange-rate adjustments supplemented use of reserves even in the earlier period: the pegged rate was changed in 1946 and 1949 before final abandonment in 1950. Third, intervention in the earlier period took the form not only of rate adjustments and official dealing in the market but also of direct controls over international trade and payments. Yet a significant "before-and-after" contrast appears from the data presented in Table 1.

A further clue to Exchange Fund operations during the free-rate period is the fact that the fund was usually building up its holdings of gold and US dollars (that is, tending to restrain or depress the Canadian dollar) during months when the Canadian dollar was generally rising and drawing down its holdings (that is, tending to support the Canadian dollar) during months when the Canadian dollar was generally fall-

[16] See, for example, the statements in Parliament of Finance Minister Abbott on February 19, 1953, and of Finance Minister Harris on April 5, 1955, printed in House of Commons, *Parliamentary Debates* for these dates, pp. 2120 and 2729 respectively.

[17] Underlying data come from various issues of the *Canadian Balance of International Payments,* prepared by the Dominion Bureau of Statistics, and from the Bank of Canada's *Statistical Summary* and supplements.

Table 1. Variability of Official Reserves of Gold and United States Dollars Before and Under the Free Rate

Period	Average change disregarding direction				Coefficient of variation of end-of-month holdings
	Millions of US dollars		Percentages		
	Within quarters	Within months	Within quarters	Within months	
1946 through third quarter, 1950..	144.0	54.5	14.3	5.4	33.4
Fourth quarter, 1950, through second quarter, 1957.....	40.3	19.9	2.3	1.1	4.6

Source: Computed from data published in various issues of Bank of Canada, *Statistical Summary*, and supplements.

ing. Such passive resistance to market movements occurred in 63 out of the 81 months from October, 1950, through June, 1957. In only 18 months did fund operations appear to be reinforcing or determining the trend.

Another way of considering the same matter was to correlate the monthly figures on Exchange Fund operations from October, 1950, through June, 1957, with the average daily change in the Canadian dollar rate as computed by fitting a least-squares straight-line trend to the daily quotations within each month.[18] (Uptrends in the rate and operations tending to support the rate—i.e., reserve losses—were treated as positive, the opposites as negative.) The resulting correlation coefficient of −0.59 (derived from 81 "observations" and significant at better than the .01 level if the usual test is thought applicable) indicates the fund's practice of indecisively resisting rather than intensifying or determining exchange-rate movements.

[18] For the exchange-rate trends, see the appendix table.

A further experiment was to correlate the two sets of figures just mentioned without regard to algebraic sign. If large fund operations went with small exchange-rate trends and small operations with large trends, yielding a negative correlation, this would suggest that the rate was stable or unstable according to whether the fund was especially active or inactive. Such a result would suggest that the Exchange Fund deserves much of the credit for whatever exchange-rate stability has prevailed. If, on the other hand, large fund operations went with large exchange-rate trends and small operations with small trends, yielding a positive correlation, this would suggest that especially great fund activity occurred primarily in response to rapid change in the market (and was not dominant enough to suppress it), and that steadiness when it occurred was primarily due to the forces of private supply and demand rather than to heavy official intervention. The latter interpretation was in fact supported by a correlation coefficient of +0.33 (significant at the .01 level).

The foregoing evidence of mild resistance to short-run trends in the exchange rate does not cast doubt on the fund's announced policy of refraining from intervention except to counter excessive short-run wobbles. For the fund cannot know at once that a given rate change is but a brief wobble. The fund will presumably try to steady the rate but will stop trying if a continuing market tendency shows the change to have been more than random. If the general tendency of the exchange rate during a particular month turns out to have been mainly in one direction, the fund's continual "testing" of the market will have produced an unintentional net gain or loss of reserves and will appear, misleadingly, to indicate deliberate resistance to the trend.[19]

In summary, the managers of the Canadian Exchange Fund have shown remarkable restraint. They apparently have avoided "determining the rate," have limited themselves to moderating minor short-run wobbles, and have stopped resisting a rate movement when it proved persistent. By refraining from active intervention, the managers have avoided the market disorder likely to result when speculators operate according to their guesses about official intentions. The managers have avoided giving speculators the "one-way option" that characterizes a system of temporarily - pegged - but - frequently - adjusted exchange rates.[20]

[19] Cf. Samuel I. Katz, *Bulletin d'Information et de Documentation de la Banque Nationale de Belgique,* May, 1955, pp. 7-8.

[20] *Ibid.,* pp. 8 and 11, makes some hints toward this interpretation.

The Canadian experience contrasts sharply with episodes such as those of Spain in 1906 and France in 1937-38, when official intervention was active enough to produce the disorders mentioned above. Cf. Francisco Gil y Pablos, *Estudios Sobre La Moneda y los Cambios* (Madrid: Reus, 1906), Appendix, especially pp. 334 and 347-51; and Robert Solomon, "The French Exchange Stabilization Fund," *Federal Reserve Bulletin,* Vol. 36 (January, 1950), pp. 36-37.

Speculative Capital Movements

Something may be learned about speculation not only by observing whether the exchange market has behaved in an orderly manner but also by studying reported capital movements as classified into two categories: (1) investment capital movements — direct investment and new issues and retirements of securities, and (2) short-term capital movements — transactions in outstanding securities and changes in Canadian-dollar holdings of foreigners, as well as the "other capital movements" listed in the Canadian balance of payments. These "other" movements include changes in international commercial indebtedness associated with hastening or delaying payments for Canadian imports and exports, changes in balances owing between corporate affiliates, loans between unaffiliated parties, changes in the foreign-exchange holdings of banks, various capital movements not directly recorded, and other errors and omissions.[21] Without suggesting that first-

[21] Dominion Bureau of Statistics, *Canadian Balance of International Payments, 1946-1952,* p. 49; Samuel I. Katz, *Bulletin d'Information et de Documentation de la Banque Nationale de Belgique,* May, 1955, p. 10, and footnote to table on p. 3; Samuel I. Katz, 'The Canadian Dollar: A Fluctuating Currency," *Review of Economics and Statistics,* August, 1953, p. 237; R. A. Radford, "Canada's Capital Inflow, 1946-53," International Monetary Fund

category capital movements are entirely nonspeculative and second-category movements are entirely or even predominantly speculative (one obstacle to such a suggestion being the difficulty of distinguishing more than very loosely between speculative and nonspeculative actions), it may still be urged that the second category is more likely than the first to contain a significant speculative element. The rather obvious a priori reasons for this belief are supported by the heavy short-term capital inflows into Canada in the summer of 1950, when upward revaluation of the pegged Canadian dollar was generally expected. During the free-exchange-rate period, also, the two types of capital movements have behaved differently. A correlation of the quarterly figures for the two types from the third quarter of 1950 through the second quarter of 1957 yields a coefficient of only +0.04 (capital inflows into Canada were taken as algebraically positive and outflows as negative). Over the same period, the correlation between quarterly figures for investment capital movements and the excess of Canadian over American long-term interest rates was +0.32, whereas the correlation between short-term capital movements and the long-term interest-rate spread was −0.54.[22]

Particularly notable is the relation between short-term capital movements and behavior of the exchange rate. An average daily change in the United States rate on the Canadian dollar was computed for each quarter by fitting a least-squares straight-line trend to the daily quotations during the quarter. The larger this figure is, negatively or positively, the more sharply was the Canadian dollar falling or rising on the average over the quarter. To measure how high the Canadian dollar was in each quarter in relation to the recent past, each quarterly-average exchange rate was expressed as a percentage of the previous quarterly average. Short-term capital movements and the exchange-rate trend, as both concepts have already been defined, showed a correlation coefficient of −0.32 for the 27 quarters from the fourth quarter of 1950 through the second quarter of 1957. Short-term capital movements showed a correlation of −0.64 with the exchange rate expressed as a percentage of the previous quarter's rate for the 26 quarters from the first quarter of 1951 through the second quarter of 1957. (The last quarter of 1950 was not included because comparison of its average exchange rate with that of the preceding quarter would have involved a time when the Canadian dollar was not yet free.) An interpretation of these results follows presently.

Remembering, meanwhile, that short-term capital movements are not a true measure of speculation but only a clue to it, we may consider another possible clue in the divergence between short-term and long-term capital movements. For example, a given short-term capital movement may be a more significant sign of speculation when not accom-

Staff Papers, Vol. 4 (February, 1955), p. 241; Arthur I. Bloomfield, *Speculative and Flight Movements of Capital in Postwar International Finance* (Princeton: Princeton University, Department of Economics and Sociology, International Finance Section, 1954), p. 48 and footnote.

[22] See the appendix table for the underlying figures.

panied by a long-term capital movement in the same direction, and especially when accompanied by a long-term capital movement in the opposite direction, than when in sympathy with the movement of long-term capital. The result of subtracting long-term from short-term capital movements (inflows of each type still being counted as positive and outflows as negative and the difference between the two having sometimes one sign and sometimes the other) was correlated with the exchange-rate trend for 27 quarters and also with the exchange rate as a percentage of the previous quarterly average for 26 quarters; the coefficients are −0.51 and −0.71 respectively.

Standard qualms about correlation of time-series data apply with less than the usual force to the quantities mentioned above. None of the series is dominated by obvious trends; the capital movements and the two indicators of exchange-rate behavior have often undergone sharp changes from one quarter to the next. So far as the four negative correlation coefficients are meaningful (and if the usual tests are thought relevant, all but the −0.32 appear significant at the .01 level), speculative or quasi-speculative capital movements have, by and large, apparently worked *against* exchange fluctuations of the Canadian dollar, tending to buoy up the Canadian dollar when it was falling and when it was low in relation to the previous quarter and tending to restrain it when it was rising and when it was high in relation to the previous quarter. These results thus document an impression already voiced by several scholars: speculation on the free exchange rate has generally tended to resist rather than intensify movements.[23] This phenomenon contrasts with the disequilibrating speculative capital transfers experienced before the freeing of the Canadian dollar.[24]

To say that speculation on the Canadian dollar has generally resisted rather than intensified rate fluctuations is not quite the same as to say that it has been equilibrating. Speculation might be considered equilibrating, even when intensifying rate movements, if it hastened attainment of the rate appropriate for emerging price-level and interest-rate relations and for other "fundamental" supply and demand conditions in international trade. Speculation might be considered disequilibrating if, by delaying exchange-rate movements in accordance with "fundamental" conditions, it caused adjustments to be all the sharper when they finally occurred. Speculation could conceivably stabilize an exchange rate "too much" and so hamper its functioning as a means of adjustment to changed conditions.[25] The Canadian experience

[23] Even the International Monetary Fund, in its *Annual Report* for 1953 (p. 70) observes that "capital movements, on the whole, have been equilibrating rather than disturbing. Canadian trade and normal capital movements have accordingly not lost the important benefits that are commonly associated with rate stability."

[24] Cf. Radford, *loc. cit.*, pp. 218-19, 248, and 252; Alan O. Gibbons, "Foreign Exchange Control in Canada, 1939-51," *Canadian Journal of Economics and Political Science,* Vol. 19 (February, 1953), p. 50; H. A. Stevenson, "Economic and Financial Conditions Affecting Canada," *Commercial and Financial Chronicle,* Vol. 172 (December 14, 1950), p. 66.

[25] Cf. Milton Friedman, *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), especially pp. 182-87.

is not necessarily, therefore, an example of speculation that was equilibrating in the sense of being based on a correct diagnosis of objective conditions. The theory and information necessary for judging that are not available. In a more modest sense, however, the Canadian experience is significant: it clearly fails to bear out the standard contention that speculation intensifies functionless fluctuations in a free exchange market.

Trade and Investment

Fluctuating exchange rates are commonly considered a deterrent to international trade and investment. Canada's trade and international capital movements have nevertheless been much larger since the unpegging of the exchange rate than before. In large part, of course, this simply reflects general economic growth. A more meaningful comparison is of the *rates* of year-to-year growth of the total physical volume of Canadian commodity exports plus commodity imports and also of the total constant-dollar value of goods-and-services exports plus imports in the postwar period before and after the unpegging. Because 1945 was still mostly a war year and because the exchange rate remained fixed only during the first three quarters of 1950, some doubt exists about just which "before and after" periods to consider. The various possibilities are shown in Table 2.

Another useful comparison is between the percentages of total United States commodity trade done with Canada before and since the free rate. Table 3 also gives the percentages of trade with "Northern North America" to show that the statistical confusion caused by union of Newfoundland with Canada in 1949 makes no important difference.

Still another clue may lie in the total of Canadian imports and exports expressed as a percentage of total world imports and exports. This figure averaged 5.56 percent in 1947 through 1949, 5.53 percent in 1947 through 1950, and 5.81 percent in 1951 through the first half of 1957.[26] Con-

Table 2. Growth of Canadian Exports plus Imports Before and After 1950

Period	Average yearly percentage increase	
	Quantum of commodity trade	Price-deflated value of trade in goods and services
1945-49	−1.74%	−3.46%
1945-50	−1.00	−2.07
1946-49	+1.06	−0.99
1946-50	+0.99	+0.00
1950-56	+6.28	+6.23
1951-56	+5.60	+5.96

Source: A quantum index of exports *plus* imports was obtained by averaging separate export and import quantum indexes (1948 = 100), using 1948 money values as weights. Original data were published in various issues of *International Financial Statistics.*

For goods-and-services trade, the export and import values published in the Canadian National Accounts (Dominion Bureau of Statistics, *National Accounts, Income and Expenditure,* Third Quarter, 1957, and earlier issues) were deflated by the export and import price indexes given in *International Financial Statistics* and then added together. The yearly average percentages of increase (or decrease) were obtained by fitting exponential trends to the trade figures for the years indicated (i.e., by fitting linear trends to the logarithms).

[26] Underlying data are from various issues of *International Financial Statistics.* Comparable figures for 1946 are not available. In 1938, the Canadian share of world imports plus exports was 3.85 percent.

Table 3. United States Commodity Imports plus Exports in Trade with Canada and with Northern North America as Percentages of United States Trade with all Countries

Period	Trade with Canada	Trade with Northern North America
1929-49	15.56%	15.92%
1929-50	15.80	16.14
1946-49	16.72	17.11
1946-50	17.53	17.84
1951-56	20.51	20.52

Source: Computed from data published in U.S. Department of Commerce, *Business Statistics*, 1955 edition, pp. 104-5 and 108-9, and *Survey of Current Business*, March, 1956, and March, 1957, pp. S21-S22. The figures given are averages of the separate percentages for each year in the period designated.

sidering that Canada and the United States together supplied an abnormally large share of the world's exports in the early years after World War II — a share that was bound to decline[27] — the maintenance and even slight growth of Canada's share in world trade under the fluctuating exchange rate is noteworthy.

To see whether the growth of imports and exports of goods and services has kept pace with general economic growth, we may express their total as a percentage of gross national product. This figure averaged 49.7 percent from 1946 through the third quarter of 1950 and 46.6 percent from the fourth quarter of 1950 through 1956. It is not clear whether this apparent slight lag in trade relative to gross national product suggests any discouragement from exchange-rate fluctuations; to suppose so would be to rule out, among other things, any possible connection between growth of gross national product and the freedom from exchange and other controls permitted by a free exchange rate.

For evidence of the effect of exchange-rate fluctuations on international investment, we may consider capital movements by way of foreign direct investment in Canada, Canadian direct investment abroad, and new issues and retirements of Canadian and foreign securities. (As already explained, transactions of these types are less likely than others to reflect merely speculative or noninvestment capital movements.) The algebraic total of capital inflow under these headings as listed in the Canadian balance of payments averaged *minus* C$28.8 million a year during the postwar fixed-exchange-rate period of 1946 through the third quarter of 1950 and *plus* C$582.8 million a year during the fourth quarter of 1950 through the first half of 1957. For the present purpose of assessing the influence of exchange risk, however, this difference between inflows and outflows of capital is less meaningful than figures obtained by adding the same balance-of-payments items without regard to algebraic sign (direction). This total averaged C$584.6 million a year during 1946 through the third quarter of 1950 and C$1,075.0 million a year from the fourth quarter of 1950 through the first half of 1957.[28]

[27] Ivar Rooth in International Monetary Fund, *Summary Proceedings of the Tenth Annual Meeting of the Board of Governors, September, 1955*, p. 11.

[28] See the appendix table for investment capital movements.

Wide year-to-year fluctuations make "before-and-after" comparison of the *growth* of investment capital movements (those under the headings mentioned above) rather meaningless (especially so for the algebraic totals, since the net flow was outward from Canada in 1946 and 1947). Still, it may be worth noting that investment capital movements totaled without regard to algebraic sign fell by an average of 24.9 percent a year in 1946 through 1949, fell by 5.4 percent a year in 1946 through 1950, rose by 8.4 percent a

Appendix Table

Statistics Relating to the Canadian Exchange Rate

Year and quarter	Balance-of-payments current receipts as percentage of current payments	Purchasing-power parity in US cents		Excess of Canadian over US long-term interest rates, percentage points	Capital movements, millions of Canadian dollars (inflow +, outflow −)	
		Wholesale	Cost-of-living		"Investment"	"Short-term"
1950 IV	87.1	99.504	102.004	+.49	+ 27	− 15
1951 I	81.5	98.541	102.869	+.68	+ 45	+ 76
II	77.7	96.394	100.822	+.63	+188	+188
III	95.7	95.017	98.586	+.65	+ 58	− 65
IV	110.3	96.030	98.104	+.72	+225	−210
1952 I	102.3	97.436	98.187	+.84	+119	−173
II	103.2	99.666	99.726	+.92	+174	−201
III	105.4	101.026	100.809	+.99	+103	−161
IV	101.1	100.932	100.925	+.89	+ 80	−124
1953 I	86.3	100.096	100.977	+.80	+198	− 34
II	88.0	100.384	101.980	+.64	+ 56	+ 29
III	99.0	101.024	101.779	+.75	+ 99	− 88
IV	96.7	101.255	101.488	+.84	+177	−119
1954 I	86.2	101.884	101.926	+.82	+231	− 59
II	87.0	102.522	101.749	+.57	+ 71	+142
III	101.4	103.003	100.994	+.55	+ 33	− 25
IV	94.6	103.094	100.497	+.49	+ 73	+ 18
1955 I	87.0	102.562	100.782	+.30	+ 95	+ 12
II	90.0	101.917	100.840	+.18	+ 52	+149
III	95.0	102.050	100.990	+.20	+100	− 17
IV	85.3	101.862	100.704	+.41	+ 47	+147
1956 I	78.9	101.944	100.816	+.45	+ 94	+233
II	79.3	102.110	101.173	+.54	+317	+127
III	89.6	102.028	100.849	+.56	+247	− 45
IV	81.8	103.005	100.497	+.61	+353	+ 10
1957 I	77.8	103.197	100.926	+.80	+294	+ 93
II	75.5	103.733	101.218	+.79	+378	+146

Appendix Table (continued)

Quarterly av. exchange rate as percentage of preceding quarterly av.	Av. rise (+) or fall (−) per trading day of the Canadian dollar rate in ten-thousandths of a US cent			
	Within quarters	Within months		
	− 6	+417	− 9	−677
99.96	+ 87	−179	+376	−195
98.65	−214	−768	−311	+158
100.65	+ 98	+365	−360	+ 75
101.65	+565	+418	+367	+855
103.95	+240	+497	+167	+483
101.95	+ 56	+132	−120	+460
101.86	+229	+ 75	+239	+ 21
99.26	−164	−146	−522	+165
99.36	−311	+ 54	−693	+153
98.62	−244	−208	− 44	−152
100.26	+195	+179	+148	+508
101.07	+241	+115	+277	+134
100.79	+ 27	+248	+396	−601
98.72	+ 15	−466	+148	+214
101.16	+125	+323	+123	+126
100.25	+ 52	− 21	+ 84	+129
99.33	−437	−122	−1187	+249
98.99	+ 32	−323	+233	+ 3
99.97	− 75	+ 95	−106	−159
98.78	−113	−345	−145	+ 37
99.92	+ 2	+ 26	+ 4	− 6
100.75	+285	+245	+274	+498
101.14	+100	− 60	+114	+160
101.48	+347	+234	+730	+203
100.79	+124	+171	+ 37	+ 63
100.23	+163	+ 46	+175	+ 29

Sources: Current receipts and payments and capital movements are from Dominion Bureau of Statistics, *Quarterly Estimates of the Canadian Balance of International Payments,* Third Quarter, 1957, and earlier issues. ("Investment" and "short-term" capital movements are defined as in the text.) Wholesale and cost-of-living purchasing-power parities were computed as described in footnote 10 by use of official United States and Canadian wholesale and consumer price indexes (published in the *Federal Reserve Bulletin* and the Bank of Canada *Statistical Summary*). The interest-rate spread is the excess of the rate on hypothetical 15-year Canadian government bonds (published in the *Statistical Summary*) over the "old series" for US government long-term bonds (published in the *Federal Reserve Bulletin*). Exchange rates as percentages of the previous quarterly averages are derived from the monthly exchange rates published in the *Federal Reserve Bulletin.* The average changes per market day in the exchange rate were computed by fitting least-squares straight-line trends to the daily quotations within each quarter and within each month; the underlying daily quotations are from the mimeographed weekly releases of the Federal Reserve Board through October, 1955, and from the *Wall Street Journal* thereafter. (The figures for the three months in each quarter are arranged from left to right; thus, the figures for January, February, and March, 1951, are −179, +376, and −195 respectively.)

year in 1950 through 1956, and rose by 8.2 percent a year in 1951 through 1956.[29]

[29] These average percentages were obtained by fitting exponential trends to the yearly figures for the periods indicated. Incidentally, the average percentages of decline for 1946-49 and for 1946-50 differ markedly because of the great spurt in capital inflow in 1950, when official upward revaluation of the pegged Canadian dollar was generally expected. This spurt apparently reflects speculative influences on the timing of even investment-type capital movements.

No one knows, of course, "what would have happened" to Canada's international trade and capital movements if the exchange rate had been kept fixed in the 1950's. What can be said is that any damage in accordance with the standard theoretical worries about fluctuating exchanges has been so slight as to be covered up by other influences.

Pricing Behavior: Economic Theory and Business Practice

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THE MARGINAL THEORY of the firm developed by Marshall, Chamberlin, Robinson, and others is well known; it forms the core of economic theory as to pricing policies for individual products. However, as the Great Depression of the 1930's lingered on, it was apparent that the economy did not automatically adjust toward full employment. Among the variables which did not adjust very much were the prices of manufactured goods, especially those produced by highly concentrated, or oligopolistic, industries. Numerous economists believed that if these prices were more flexible the depression would end more quickly. Business pricing policies thus became the focus of attention (witness the hearings and investigations of the TNEC), and in this context R. L. Hall and C. J. Hitch undertook to survey 38 English businessmen about their pricing policies.[1] In reporting their results Hall and Hitch introduced the concept of "full-cost" pricing;[2] they also questioned the relevance or validity of some aspects of the marginal theory that has descended from Marshall. Since 1939, when Hall and Hitch published their findings, a fairly large body of literature has appeared on the subject of pricing policies, involving empirical and theoretical research.

In 1946, R. A. Lester published the results of an empirical investigation he undertook in order to ascertain to what extent businessmen equated marginal productivity with marginal revenue product.[3] Lester, like Hall and Hitch, was critical of marginal theory.

At this juncture, Fritz Machlup set forth to defend the marginal theory and to attack Hall and Hitch and Lester.[4] Briefly stated, his criticisms were as follows: prime or direct cost per unit is taken as the base, a percentage addition is made to cover overheads, and a further conventional addition is made for profit.

[1] R. L. Hall and C. J. Hitch, "Price Theory and Business Behavior," *Oxford Economic Papers,* May, 1939, pp. 12-45.

[2] Full-cost pricing has no single, simple definition, but it can be generalized as fol-

[3] R. A. Lester, "Shortcomings of Marginal Analysis for Wage Employment Problems," *American Economic Review,* Vol. 36 (March, 1946), pp. 62-82.

[4] Fritz Machlup, "Marginal Analysis and Empirical Research," *American Economic Review,* Vol. 36 (September, 1946), pp. 519-54.

lows: proponents of full-cost pricing fail to understand marginal analysis; their research techniques are faulty; and they have mistakenly interpreted their findings. Machlup also restated — clearly and in some detail — his own interpretation of marginal theory: what it is, what it says, what it attempts to do, what it does not say, and what it does not do.

From this point on, it becomes impossible to trace a single thread of development. On the theoretical side contributions were made by Gordon, Reder, Harrod, and Scitovsky.[5] In addition, a great deal of empirical research was done by P. W. S. Andrews,[6] who may well be considered the leading proponent of full-cost pricing. R. B. Heflebower has also made and reported on a comprehensive survey of the literature and empirical findings pertaining to full-cost theory.[7]

This article will (1) sharpen and clarify the controversial issues (that is, show where the two sides are in practical agreement and where there appears to be fundamental disagreement), and (2) point out areas where more research is needed.

Issues in the Debate

Competition vs. Oligopoly

The marginal theory of highly competitive markets is accepted by both critics and proponents of marginal cost pricing. Sellers in such markets are "price-takers"; that is, sellers do not have effective control over their selling prices, and they can have no established pricing policy other than to take (or leave) what the market is offering. The market price is determined by marginal buyers and sellers, who usually are not the same people in successive time periods (i.e., there are no "price leaders"). Sellers of agricultural products and common grades of textiles are usually considered to be typical price-takers.

However, the average-cost theorists are concerned with markets characterized by monopoly, monopolistic competition, oligopoly, and "linked-oligopoly."[8] In such markets the sellers are characteristically "price-makers"; that is, the sellers either quote prices which are the result of their own calculated pricing policies, or they follow an established price-leader, who in turn has a definite, calculated pricing policy. Most manufactured products — for example, steel and autos — are usually characterized by this type of price behavior.

[5] R. A. Gordon, "Short-Period Price Determination in Theory and Practice," *American Economic Review,* Vol. 38 (June, 1948), pp. 265-88; M. W. Reder, "A Reconsideration of the Marginal Productivity Theory," *Journal of Political Economy,* Vol. 55 (October, 1947) pp. 450-58; R. F. Harrod, "Theory of Imperfect Competition Revised," in *Economic Essays* (London: Macmillan, 1952); and T. Scitovsky, *Welfare and Competition* (Chicago: R. D. Irwin, 1951).

[6] *Manufacturing Business* (London: Macmillan, 1949).

[7] "Full Costs, Cost Changes, and Prices," in *Business Concentration and Price Policy* (Princeton: Princeton University Press for the National Bureau of Economic Research, 1955).

[8] The first theoretical argument for "linked-oligopoly" was given in 1935 by Nicholas Kaldor in "Market Imperfection and Excess Capacity," *Economica* (New Series), Vol. 2 (February, 1935), pp. 33-50.

Long Run vs. Short Run

All parties seem to be in agreement as to the long-run tendencies of price behavior. Specifically, all agree that in the long run, price will cover total costs, including profits. Gordon, for example, says that

> In the long run, the theorist and the empiricist have relatively little quarrel so far as the average cost vs. marginal cost controversy is concerned. The theorist admits the importance of average costs and the empiricist grants that, for many types of problems in the long run, incremental costs play an important role.[9]

It is the short-run situation which leaves the average-cost theorists most unhappy. Here, they argue that the marginal theory is neither a very useful descriptive tool nor a good predictive device; that is, given changes in demand during the business cycle, the marginal theory gives little insight into how prices will behave.

Price and Quantity vs. Other Variables

Marginal theory considers as endogenous those variables over which entrepreneurs have control — price, quality, style, advertising, research and development, and so on. Those variables outside the control of the firm, such as shifts in demand, elasticity of demand, taxes, and the rate of interest, are exogenous,[10] and marginal theory focuses on how price and quantity vary with changes in the exogenous variables. By ignoring the other endogenous variables, the marginalists implicitly assume that they are unimportant compared with the variables treated explicitly. Critics contend that some of the ignored variables (impounded in *ceteris paribus*) may be more important than price to entrepreneurs. In other words, they argue that these variables may be changed first, more frequently, and more drastically than price, and that, therefore, they deserve more explicit treatment. For example, a falling off in sales may cause firms to increase advertising and selling efforts, or to change styles (as with women's clothes), or (as in the automobile industry) to make more drastic changes in the new models.

An Operational vs. a Subjective Approach

There is no such thing as a unified body of thought on full- or average-cost pricing. Various writers assert that it is a short-run phenomenon, whereas others contend that it is a long-run phenomenon. Since its original introduction by Hall and Hitch, full-cost pricing has come to include all theories that relate prices only to costs. The chief proponents of full-cost theory are usually empiricists, who are interested in an operational price theory capable of empirical testing, verification, and prediction.

Marginalists, on the other hand, have a more subjective approach. At this point it is necessary merely to indicate that the marginalists are content with theory which, while completely logical, is almost completely subjective — especially when applied to anything but almost perfectly competitive markets.[11]

[9] *Loc. cit.*, p. 275.

[10] Note that in monopolistic situations, demand is not independent of expenditures on advertising.

[11] Compare R. A. Gordon's statement: "As Professor Machlup has shaped the tools, the empirical worker will continue to get little help, although he will have the satisfaction of gazing at a tool box fashioned with impeccable logic."

"Rules-of-Thumb" vs. Profit Maximization

It is now generally accepted that many day-to-day, week-to-week, and month-to-month pricing decisions are made by "rule-of-thumb." Price-makers *must* use some kind of theory because they cannot maximize profits by consciously equating marginal cost with marginal revenue. However, very little is known specifically about these rule-of-thumb policies, and more quantitative research would be useful.

The widespread use of rules-of-thumb suggests to the empiricists two major defects in marginal theory. First, the theory gives no insight into why these rules-of-thumb exist, how they are formulated, or how often they will change. Yet these questions are at the very heart of most price-making decisions. Second, and more important, it is not at all clear that rule-of-thumb policies either aim at or achieve maximum profits (in either the short or the long run).

It is probably incorrect to say that businessmen do not try to maximize profits. The more correct statement would be that they try to maximize profits *subject to certain restraints* — which may be rather severe at times — and that rules-of-thumb possibly do maximize profits within these restraints. Examples of some restraints would be the need to pay cash dividends, restrictions in labor contracts, and administrative efficiency. Businessmen may also be restrained from maximizing profits in strict accord with marginal theory since they do not operate along a single-valued cost curve: changing the rate of output within fairly wide limits may change unit costs only by ± 5 percent, but such factors as labor troubles, work slowdowns, and price changes on raw materials inventories may cause much wider cost fluctuations, say ± 20 percent. Marginalists acknowledge the existence of these restraints but rarely treat them explicitly.

Full-Cost Theory

Purposes and Description

As previously noted, full-cost theory aims at making objective, quantitative statements about prices and the frequency and magnitude of price changes under various conditions. However, it has not been fully developed as a systematic, unified body of thought. The present state of the concept may be described as mostly institutional description. What little "theory" there is consists chiefly of rather uncertain generalizations about observed business behavior.

Empirical evidence indicates that businessmen add a percentage markup (for profit) to their average costs in order to set their prices.[12] Average cost is an estimate of total unit cost when operating at a "normal" percent of capacity. This differs from marginal theory in asserting that demand does not enter into pricing decisions and that businessmen do not try to maximize profits when deciding what prices to

[12] For a more complete description of the various methods used to set prices, see A. R. Oxenfeldt, *Industrial Pricing and Market Practices* (New York: Prentice-Hall, 1951), Ch. 4. He has done a monumental job of assembling and compiling facts, data, and ideas relating to industrial prices and pricing practices.

charge. At first sight, the theory seems to coincide with business behavior and experience.[13]

The following "rules" suggest the present status of full-cost theory:

(1) Where an element of oligopoly is present, and in many cases where it is absent, there is a strong tendency among businessmen to fix prices directly at a level they regard as their full cost.[14]

(2) Prices so fixed have a tendency to be stable. They will be changed if there is a significant change in wage or raw material costs but not in response to a moderate or temporary shift in demand.[15]

(3) There is usually some element in the prices at any time which can be explained only in the light of the history of the industry.[16]

(4) Even in extreme circumstances, entrepreneurs will strongly resist lowering prices below a point which would, at the *best* level of output, yield less than total cost.

(5) Entrepreneurs tend to figure cost on the basis of original cost rather than replacement cost (both for inventories and for fixed costs).

Shortcomings and Criticisms

On closer examination, certain discrepancies appear in the full-cost theory. The markup differs from firm to firm, from product to product (even within the same firm), and from time to time (on the same product). On many occasions the markup appears to have been changed in response to changes in demand. Full-cost theorists have offered no substantial explanation for this variance, nor have they given any rules for predicting when, why, or by how much markups will be varied. Furthermore, "capacity" plays a crucial role in the theory but is defined only in a vague way; and although firms calculate average costs at a "normal" percent of capacity, normality is undefined.[17]

Because of these shortcomings, economic theorists have in general been inclined to reject full-cost theory, but they are by no means unanimous on this point. Harrod, Scitovsky, and Alchian[18] have tried to rationalize the observed behavior; and it appears that Fellner and Chamberlin would also give the full-cost principle a place in the theory.[19]

Contributions of Empiricists

The empiricists have made several contributions. First, they have brought to light some shortcomings in the marginal theory which were neither evident nor universally recognized. It has thus become apparent that price theory does not say what prices will be nor does it attempt to predict *how much* prices will change with changes in demand or in

[13] Heflebower states that average-cost pricing was a standard part of business textbooks before 1939.

[14] Hall and Hitch, *loc. cit.*, p. 32.

[15] *Ibid.*

[16] *Ibid.*

[17] Constant costs, when they obtain, are a way out of this dilemma.

[18] A. A. Alchian, "Biological Analogies in the Theory of the Firm," *American Economic Review*, Vol. 43 (September, 1953), pp. 600-3.

[19] R. B. Heflebower, *loc. cit.*, p. 362.

other exogenous variables.[20] As the subjective nature of the marginal theory became explicit, Reder commented that "It greatly reduces the range and importance of the conclusions that the theorists of an earlier day believed they could deduce from the theory."

Second, the empiricists have shown that in many industries (especially the durable goods industries) the long-run considerations usually outweigh the short-run factors. Hence, in applying the marginal tools one must be cautious in predicting that entrepreneurs will attempt to maximize short-run profits.

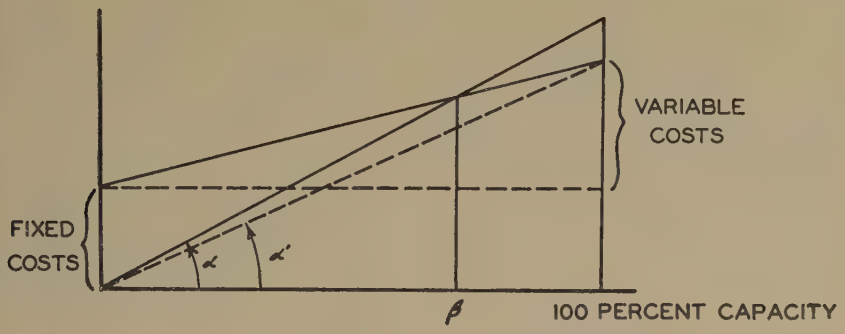
Third, they have formulated a set of rules and observations which may improve predictions of short-run price behavior. For example, a traditional result of marginal theory is that if variable costs increase, price will go up, but by a lesser amount — depending upon the elasticity of demand. A common textbook example of this is the levying of excise taxes. The full-cost doctrine would predict, however, that price will rise by the amount of the change in costs *plus* the usual markup. Marginalists would probably dismiss this as nonrational behavior. Nevertheless, it may consistently occur as the result of the uncertainty facing the firm, the firm's institutional setting, and its adherence to tradition. If it does in fact occur, it would seem to have certain policy implications. It is also an operational result that would not be obtained from the application of marginal theory.

The preceding example may be extended further. Heflebower indicates that cost-plus-markup is the common pricing policy used in the distribution trades — wholesaling and retailing. The distributor's percentage markup appears to change very little, probably because of the large common fixed costs involved in retailing. It may happen, therefore, that a rise in the manufacturer's cost will not only be passed along, but a markup will be added at several stages before the product reaches the consumer.

The full-cost theory also differs from marginal theory in setting different, narrower limits within which price variations are predicted. Consider, for example, the break-even chart, a familiar tool of businessmen. A simple form of the break-even chart contains two lines, one showing the total cost for various levels of output and the other showing total sales for a given price (see Chart 1). The angle that the total revenue curve makes with the base, α, is determined by the selling price. Varying the selling price will vary α and thus change the break-even point β. The break-even chart does not say how much will be sold at any one price, nor does it even say how much the entrepreneur *expects* to sell at any one price; therefore, it does not show how much the actual profit will be. Hence the break-even point is a very poor tool for determining the "best" selling price (i.e., the price which will make the most money). But in practice, it appears that business

[20] Cf. Machlup's statement: "The theory of the 'equilibrium of the single firm' is not as ambitious as is often believed. It does *not* attempt to give all the reasons why a given firm *makes the output that it produces;* why it employs the workers that it employs; or *why it charges the prices that it charges.*" *Loc. cit.*, p. 520; italics added.

Chart 1



men do use it. In view of this fact, the average-cost theory might be extended to include some statement similar to the following: only when resigned to eventual elimination from the market will businessmen set price below that which will allow them to "break even" at their most efficient point of production. (Note the angle α' in Chart 1, where the assumption is that the lowest cost will be at 100 percent of capacity.) In other words, businessmen will never charge a price so low that they will not have a break-even point. In marginal terms, this means that businessmen will not set price below the lowest possible average total cost. This may mean that in some instances the firm is operating nonrationally, for it is easy to visualize a set of marginal conditions in which it would pay the firm — "pay" in the sense of minimizing losses — to lower price below lowest possible average total cost.

A recent article by J. S. Early suggests that cost accountants are investigating ways of defining concepts more in line with "economic" theory (i.e., definitions and concepts would be more useful for decision-making).[21] Should accounting continue to develop along this line, business decisions might come to be made in a more "rational" framework. At the present time, however, it appears that fixed costs — usually computed on an original-cost basis — enter into most pricing decisions and that this may explain much of the observed price rigidity.

Marginal Theory

In order to put the debate into full perspective, it will be necessary to review briefly certain aspects of the marginal theory. Of course, it is very difficult to talk about "THE Marginal Theory," because, as Machlup says, "It has been developed gradually over a period of more than a century, [and] it will not suffice to take any particular writer as one's authority or any particular exposition as one's text."

Subjectivity of the Marginal Theory

The position of the marginalists cannot be appreciated unless one is aware

[21] J. S. Early, "Recent Developments in Cost Accounting and the Marginal Analysis," *Journal of Political Economy*, Vol. 63 (June, 1955), pp. 227-42.

of the subjective interpretation given to theory. The following passage from Machlup illustrates the position:

> The proposition that the firm will attempt to equate marginal cost and marginal revenue is logically implied in the assumption that the firm will attempt to maximize its profit (or minimize its losses). It should hardly be necessary to mention that all the relevant magnitudes involved — cost, revenue, profit — *are subjective* — that is, perceived or fancied by the men whose decisions or actions are to be explained (the businessmen) — *rather than "objective"* — that is, calculated by disinterested men who are observing these actions from the outside and explaining them. . . . The producer's actual decision is based on what he himself thinks; it is based on "subjective" cost expectations . . . one must not assume that all producers "really" know their cost in the sense in which an efficiency expert would determine it. . . . The same thing is true with regard to price expectations and sales expectations. It is the "demand as seen by the seller" from which his revenue expectations stem. The increase in demand which is relevant in the analysis of the firm *need not be "the real thing"*; it may precede an "actual" increase in demand, lag behind it, *or be entirely imaginary. The businessman does what he does on the basis of what he thinks*, regardless of whether you agree with him or not. *Marginal analysis of the firm should not be understood to imply anything but subjective estimates, guesses, and hunches.*[22]

Interpreted in this way, the theory is, for all practical purposes, a tautology. It says that a businessman does what he does because he is trying to maximize (pecuniary) profits. If the theory were amended slightly, one might say that entrepreneurs maximize the sum of their pecuniary and nonpecuniary profits, a summary that leaves the theory entirely tautological — something Machlup himself recognizes.

The fact that the theory is tautological certainly does not invalidate it. Nor does it mean that it is useless. On the contrary, the marginal theory is the only analytical tool for analyzing the *ex post* behavior of firms. Can one "test" such a theory? The only unequivocal answer is no. One could ask entrepreneurs if and in what sense they try to maximize profits. Should they reply that they definitely do *not* try to maximize profits, and that they are in business for philanthropy, or to get away from their wife and children for eight to ten hours a day, or some other such reason, this still would not invalidate marginal theory. It would, however, indicate that the theory may not be useful even for descriptive purposes.

Attempts at Reconciliation

Several authors have tried to show that marginal theory and empirical observations amount to the same thing. Hall and Hitch themselves state that marginal theory may be true, but only in the long run. Machlup, on the other hand, suggests that full-cost pricing is simply a means of oligopolistic collusion.

Scitovsky has a different approach. He asserts that of the few existing statistical studies of the marginal cost curve, nearly all indicate constant marginal costs over the observed range of output. He attempts to reconcile the observed business behavior with marginal theory as follows: (1) marginal cost is assumed to be constant over the relevant range of production; (2) average variable cost is assumed to be nearly equal to marginal cost and is the

[22] *Loc. cit.*, pp. 521-22; italics added.

best available estimate of marginal cost; (3) the producer, through trial and error or some other (unspecified) method, has found the proper markup factor for a given demand situation;[23] (4) in view of his ignorance concerning elasticity of demand, when demand shifts, the producer assumes that the elasticity is the same (unless he has good reason to assume otherwise), and therefore has no motive for changing price. The price charged will be the average variable cost plus some markup.

Scitovsky's discussion of the firm is extremely realistic in many respects, especially concerning the difficulty of allocating fixed common costs. Introducing a constant marginal cost curve over the relevant range of production appears to be a desirable step in making the theory more realistic. The chief weakness, however, appears to be the way in which businessmen determine the optimum markup, especially under changing demand conditions.

Scitovsky's approach is basically short term. Harrod, however, formulates a theory of long-run pricing to show that marginal and full-cost pricing amount to the same thing. He asserts that in its price policy (both in the long and in the short term), the firm considers only its long-term revenue curve. As Harrod correctly points out, when a firm is considering a decision to build a new plant or to expand capacity, it considers its long-run demand and its long-run costs. But once the funds are committed and the plant is built, the short-run cost curve is the only relevant variable. However, simply because the firm now reacts along its short-run cost curve is no reason for it to ignore its long-run demand curve. The long-run demand curve becomes almost perfectly elastic at full cost, because any price much above this would attract new entrants into the industry. Therefore, the firm sets a price just low enough to forestall new entrants. From this restatement of the theory, Harrod concludes:

> So long, therefore, as we are subject to the proviso that the entrepreneur dare not charge a price above full cost without rendering his market vulnerable, the "full-cost" criterion gives the same answer as the marginal criterion.[24]

Alchian has expanded the Hall and Hitch idea that marginal theory is true in an evolutionary sense. This is another long-term argument, and it implicitly assumes a competitive market structure. This theory would admit that short-run conditions may deviate from the optimal, but it would claim that there are (evolutionary) forces at work to bring about the optimal solution.

There is yet another "evolutionary" sense in which the marginal theory may be valid. Applied to dynamic, changing situations, the theory might seem to imply that businessmen would frequently experiment with price changes in order to maximize profits, but empirical observations show that prices are often quite stable under changing conditions. Under the assumption of *ceteris paribus*, however, price changes implied by the theory are in fact relative price

[23] The proper markup factor is e/(e-1), where e represents the sum of the weighted average elasticity of supply in factor markets and the elasticity of demand in the product market.

[24] *Loc. cit.*, p. 162. This is fairly close to Bain's work on the ease (or difficulty) of entry, and pricing to restrict entry.

changes. A relative price change will also occur when a firm leaves its price fixed while other prices change. Thus if there is a change in the general price level, including the firm's cost function, and the firm leaves its selling price fixed, it may be concluded that the firm is in fact changing its price. If the firm (and the industry) finds its profits increasing because of an unexpectedly high elasticity of demand, it will probably alter its markup policy and leave price unchanged. Thus, through a general shifting of the price level (such as has occurred since World War II) the firm may find the markup that marginal conditions call for.

Possible Origins of Misunderstanding

The early empiricists seemed to be under the impression that they would find some businessmen who consciously tried to equate marginal cost with marginal revenue. Where did they get such an impression? On this point we can only speculate, but the idea may well have come from the many writers on socialist and welfare economics who refer to "marginal cost pricing" as if it were an objective entity — something which could and should be achieved. These writers continually gloss over the fact that marginal theory is not operational and that marginal cost is not defined in any meaningful operational sense.

To elaborate slightly, it is usually recognized that there is no simple way to define the demand curve facing a firm in a linked-oligopoly situation.[25] One of the chief problems is the unknown reactions of competitors. While the demand curve includes expectations and psychological reactions, the cost function and marginal cost curve seem to be thought of as technologically determined. Unfortunately, this is not the case. Up to the present time, economists have not grappled with the problem of defining — for either a manufacturing, wholesaling, or retailing operation — which costs are included in marginal cost.[26] In reaching such a definition they would have to classify advertising costs, expenditures on research and development, common costs, day-to-day maintenance, weekly maintenance, and monthly maintenance.

The problem can be isolated by considering the time period over which to define marginal cost. In the instantaneous short run, goods in inventory are a sunk cost, and transportation and selling costs are the marginal cost of getting the goods to the consumer. If the time period is extended, and should inventories of raw materials be on hand, the marginal cost of getting goods to the consumer will be only the labor cost of manufacturing plus transportation and selling cost. If this is not the case, marginal cost will include raw material

[25] Econometricians have had remarkably little success in obtaining even fairly accurate estimates of the elasticity of demand for various products.

[26] The most notable case where marginal cost has been defined is for toll bridges.

cost. In this way, as the time period is extended, more and more costs will be included in marginal cost. In the very long run all costs are variable and hence marginal. Those who would attempt to define short-run marginal cost pricing are in a position not too dissimilar from Marx when he tried to make his labor theory of value explicit. Like Marx, they ignore the complications caused by the existence of fixed factors of production. In particular, they ignore the fact that various items entering into fixed cost have different life spans ranging from six weeks to sixty years.

Nevertheless, economists will probably go on referring to marginal cost pricing as if it were something easily defined and easily obtained. In the process they may leave many people under the false impression that businessmen consciously try to equate marginal cost with marginal revenue.

Summary and Conclusions

Full-cost theorists have now made it evident that there is a gap in our theory. As currently interpreted, marginal theory does not attempt to predict how much prices will change nor with what sort of time lag they will change, given certain changes in one or more exogenous variables such as demand. However, many aggregate and sectoral models need some theory along these lines. Much of the "debate" was caused by failing to understand that marginal theory is simply not capable of handling this job.

Average-cost theorists have contributed little in the way of a systematic theory. They have brought out failings in the marginal theory, and they have shown that businessmen set price by markup policies and rules-of-thumb not clearly related to marginal descriptions of behavior. However, markup policies show wide variation from firm to firm, product to product, and time to time. These variations seem to be best explained in terms of demand and competition, which the full- or average-cost theories ignore. We need more empirical quantitative research into the pricing practices of business firms.

Marginal theory is an analytical tool of economists, not an operational device for showing entrepreneurs how to maximize profits. Marginal theory of competitive markets may be used for predictive purposes as well as for descriptive purposes; but when it is applied to firms with varying degrees of monopoly power, it loses its predictive power. It is still a good descriptive device so long as we can assume that firms are trying to achieve near-maximum profits. The theory is a good descriptive tool because it is, practically speaking, a tautology. For this reason, the theory cannot be tested empirically.

Accountants are trying — without much help from economists — to define new concepts and develop new conventions to make accounting records more useful for decision-making purposes. If they are successful, they may make business practice coincide more closely with

economic theory. Nevertheless, the accountants have not developed and are not developing a concept explicitly coinciding with marginal cost. They could not do this, even if they wished, until economists make the meaning of marginal cost more explicit. Used in describing the behavior of business firms, marginal cost is a subjective concept. Used in welfare economics describing the attainment of a Pareto optimum, marginal cost and marginal cost pricing appear to be technologically determined and take on objective reality. This situation is likely to cause confusion in various quarters for some time to come.

Books Reviewed

American Housing and Its Use. By Louis Winnick (New York: John Wiley and Sons, 1957. Pp. xiv, 143. $5.50)

This book is one of the Census Monograph Series which includes volumes developed to exploit the statistical wealth of the census reports with analyses of trends and relationships among the data. A foreword by Robert W. Burgess, director of the Bureau of the Census, and Pendleton Herring, president of the Social Science Research Council, describes briefly the planning behind the development of the monograph series.

Although it is primarily based on census materials, the monograph draws considerably on noncensus publications and data. Frequent reference is made in the book to the limitations of census materials and the difficulties of testing hypotheses using only the data reported by the Bureau of the Census. General observations concerning the limitations of census materials are numerous; the Winnick comments, however, are sufficiently precise to be of service in the planning of the next census of housing.

A study of statistical data is usually of primary interest to specialists because the prose of the manuscript is commonly less fascinating than the subject of the study. The Winnick efforts are far less tedious than those found in most studies of quantities, but even though the style and techniques of exposition are to be commended, the book will appeal primarily to studious readers rather than to browsers.

Occasionally, Winnick injects opinions regarding matters other than his main theme with the result that attention is diverted from the points under discussion. For example, while illustrating the superior housing circumstances in the United States as compared with Russia, Winnick explains in a footnote that the Soviet death rate is about the same as in the United States and that incidence rates of major illnesses are not significantly higher than here. He further comments that ". . . a major improvement in public health services (as it has occurred in the U.S.S.R.) is a more efficient and cheaper method of reducing morbidity than raising housing standards." This digressive intelligence prompted this reviewer to ponder, among other things, If the Soviet death rate is similar to that of the United States and if it is true that the automobile is much less common in Russia than in the United States, what replaces the automobile as an instrument of extermination in the Soviet scheme?

In treating the subject of rent control, Winnick observes in passing that the disruptive influences of rent controls on housing markets were "not enough to destroy the usefulness of rent regulations under emergency conditions." If one does not accept the usefulness of rent regulations a priori, the impact of rent controls on housing markets appears to be more serious. One is also likely to wonder if Winnick evaluates the impact of rent controls generously under other than "emergency" conditions.

The standard of "persons-per-room" was used in the study as the indicator of housing utilization instead of the usual measure of occupied dwelling units. The persons-per-room approach permits new insight into housing utilization and provides Winnick with evidence to challenge some commonly accepted ideas on housing market behavior and circumstances. Persons-per-room ratios were studied in terms of income, household size, rents and values, location, and race. Chapters were also included on space trends in dwellings and the changing composition of households.

Technical information supplementing the main text is presented in five appendixes which cover statistical problems connected with the use of the persons-per-room ratio, measurement of increases in rents over time, details relating to multiple correlation analysis of persons-per-room with values and rents, data on households, and errors in census reports.

The findings are summarized in eleven categories in the Introduction. Particularly interesting are the following:

It is doubtful whether the nonfarm PPR ratio has been reduced by more than 15 or 20 percent since 1900.

. . . . . .

The distribution of housing space in 1950 was remarkably even, far more so than the distribution of income and probably more equal than is the case of any other major economic asset. As a result, severe overcrowding, i.e., more than 2 persons per room, is exceedingly rare and affects less than 2 percent of nonfarm households (less than 4 percent of the nonfarm population). The lowest income groups tend to enjoy surprisingly favorable PPR ratios; overcrowding is most frequent in the groups that lie between the bottom and the middle of the income structure.

. . . . . .

. . . the most important determinant of a household's density standard is its size. By comparison, the effect of household income or the cost of shelter is relatively small.

The obvious limitation of the study, which the author recognizes, is that qualitative measures of the housing inventory are reflected only indirectly and rarely clearly; however, it is a worthwhile contribution to the literature and is a pioneer work in new techniques of measuring the housing stock.

ROBERT O. HARVEY
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Prosperity Without Inflation. By Arthur F. Burns (New York: Fordham University Press, 1957. Pp. xi, 88. $2.00)

This little volume is one of the most interesting discussions of economic policy that has appeared in recent years. It presents Fordham University's Millar Lectures for 1957. Titles of the four lectures in the series are "The Recent Inflation in Perspective," "Dealing

with Recession and Inflation," "The New Environment of Monetary Policy," and "Public Policies for Coping with Inflation."

Taken together, these lectures represent a broad view of what policies can accomplish, what obstacles they encounter, and what risks they may entail. The short compass of the work requires that many of these points be dealt with in very summary fashion — sometimes as bare assertions or unsupported generalizations.

It is a highly readable discussion. In fact, it is so smooth that it tends to subdue the skepticism with which many readers would normally approach the subject.

This tendency toward unquestioning acceptance happens to be of some importance, since the book, including even its most factual parts, is an attempt to sell an idea. The thesis is clearly stated: "What we need more than anything else at this juncture of our great experiment in the management of prosperity is a national declaration of purpose . . . including reasonable stability of the consumer price level among the objectives of the Employment Act . . . " (p. 71).

The perspective in which this conclusion is reached is not the long perspective of our economic history but the shorter perspective of a decade of postwar prosperity. The decade has been strongly affected by international tension, and the price increases experienced as an aftermath of war have not only held but have been extended moderately during the last five years. In the spotlight of this background, all the fears of further increases are afforded full play.

Yet it is not the experienced but rather the anticipated price increases that are relied upon to support the thesis. The losses from inflation are asserted, not shown. Thus, " . . . if we continue to tolerate the upward trend of prices, the lives of millions of our people will surely be blighted and the strength of our entire economy may be damaged" (p. 67). For the recent past, even over a span including the war years, this proposition is contradicted by two facts briefly mentioned in the author's discussion of actual developments — the tremendous increase in real income and productivity and the steady progress toward income equality.

Although the argument is at first glance persuasive, it fails to carry conviction when one looks beyond the realm of economics to form a judgment in terms of political and military aspects of the situation. Inflation has had its roots in international disturbances. Further inflation is not assured in the absence of such disturbances; and if the threat of war must be faced in the future, the situation will not be one that can be dealt with by a vague statement of economic objectives.

On the other hand, the proposed declaration would almost certainly interfere with other aspects of economic policy, particularly unemployment policy. The author acknowledges this but brushes the objections aside on the basis of his judgment of what can be done by government officials who "do not seek perfection in terms of any single yardstick, but a good all-around performance" (p. 73).

This is consistent with his general optimism about what has already been accomplished. He comes very close at times to saying that the problems of recession and depression have been resolved. "The essential objective . . . is not to prevent all contractions, but rather to maintain an environment that curbs excesses from which recessions often spring and to keep such recessions as do occur from degenerating into severe depressions. Recent history indicates that our public policies can be shaped so as to powerfully promote this broad objective" (p. 29).

Throughout the book, there is a tendency to interpret events as the result of decisions on the part of officials who make economic considerations a basic element in policy formation. Despite the author's familiarity with the Washington scene, there is little place in this account for official blundering, political maneuvering, and all the other things that just happen without regard to what any economist might desire or approve. Rather consistently, the role of the economist in government affairs is exaggerated. This is perhaps to be expected in a book on this subject, but it may at times seem unrealistic to readers who are familiar with the way the mechanisms of government actually operate.

All things considered, the book is well worth the limited time required for its reading. As a plea for reform of fiscal policy and for better coordination of fiscal and monetary policy, it is bound to provoke thinking. The reader should not, however, carelessly lower his guard or he may wind up in a state where "thinking" represents judgments other than his own.

V Lewis Bassie
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Mathematical Economics. By R. G. D. Allen (New York: St. Martin's Press, 1957. Pp. xvi, 768. $10.00)

Almost anyone interested in mathematical economics knows Professor Allen's famous book *Mathematical Analysis for Economists* (1938), which is essentially a textbook of calculus, mostly differential, for students in economic theory. This new book, however, is not a revision of *Analysis*. It is not mathematics for economists, nor is it econometrics. There is no effort to test equations and formulas in the light of available statistical data. It is a new, comprehensive, and compact exposition of modern economic theory written in higher mathematical terms. Although it is intended for a variety of readers, it is doubtful whether anyone can read it without some knowledge of advanced calculus, matrix algebra, and geometry.

The book can be roughly divided into two major parts. The first part starts with cobweb dynamics, considers the role of the multiplier and the accelerator in dynamic models, and examines the Harrod, Domar, Phillips, Samuelson, and Hicks contributions in this area. Then the author goes into three purely mathematical fields — complex numbers, differential equations, and difference equations — to prepare the mathematical background for the following chapters on theories of business cycles, lags, and economic stability.

A chapter on a new field, the control systems, is attached to this part.

The second part begins with the general equilibrium. The discussion does not go very far beyond counting the equations and the unknowns. Both Walras' general equilibrium scheme and Leontief's input-output system are treated. Then the author has to take up "pure" mathematics again. This time it is the matrix algebra. It seems that the author tried to provide the mathematical tools in an economical way. He starts with vector analysis and leads into matrix algebra and linear transformation. This is not a particularly good arrangement. These chapters might have had more unity, simplicity, and coherence had more emphasis been placed on the concepts of vector space and linear transformation and had they been started with matrix algebra instead of vector analysis. Next comes a chapter on the elementary theory of games, restricted to two-persons zero-sum models, two chapters on linear programming and activity analysis, and two very good chapters on "neo-classical" theory of value and of the firm. Finally, macro and micro approaches are brought together in the last chapter on the aggregation problem.

Comparing the two major parts, the second part is better than the first. It is questionable whether so much space in the first part should be given to differential equations while the set theory, probability, series, and modern algebra are neglected. But here again it is inherently a very difficult problem to strike a balance between mathematics and economics in writing an ambitious and pathbreaking book such as this. Differences in judgment as to the inclusion and omission of various topics in this field and of the emphasis to be given each are inevitable. After all, this is economics, not mathematics. Why then should those pure mathematical concepts be included here if they are not yet frequently employed in economic theory? If the book is for economics, then two important elements of economics, money and price, have been neglected.

It is hard to realize how rapid the development of modern economic theory has been and how vast its scope is, particularly since World War II, until one sees how difficult it is to write a textbook of mathematical economic theory like this one, trying to give an adequate yet balanced coverage of the subject. It is a tremendous task. Moreover, it seems that at the present stage of its development, modern mathematical economic theory still remains to be organized and "disciplined." The field is a vast one and there are many opportunities for further exploration. Only after this is realized can it be seen that Professor Allen has done a brilliant job in his pioneering effort to present mathematical economic theory in a systematic and coherent way.

John S. Y. Chiu
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Financial Intermediaries in the American Economy Since 1900. By Raymond W. Goldsmith (Princeton: Princeton University Press for the National Bureau of Economic Research, 1958. Pp. xxxv, 415. $8.50)

Economists in this country owe a great debt to the National Bureau of

Economic Research for providing the raw materials necessary to make sense out of many aspects of economic activity. Those interested in the financial sector and its relation to other sectors are the special beneficiaries of a large-scale inquiry into capital formation and financing in the United States. This volume is one in a series of monographs reporting the results of the inquiry.

Financial intermediaries, as here defined, include commercial banks, insurance companies, investment companies, personal trust departments of banks, sales and personal finance companies, mortgage companies, government lending organizations — in short, any institution that sells deposits, shares, or equities and uses the funds to purchase other types of securities. Using a potpourri of measures, Dr. Goldsmith traces the growth of financial intermediaries. One measure, that of the growth of assets of financial intermediaries relative to the growth of total intangible assets, shows that the share of financial intermediaries rose from 19 percent in 1860 to 25 percent in 1900. Their share remained virtually stable until 1929, rose to 39 percent in 1939, and has stabilized since then. Apparently the rise took place in two bursts. Why? Although the answer is not found here, one may surmise that, with respect to the later increase, the collapse of the security markets in 1929 shifted demand to claims on intermediaries.

Another measure of the growth of financial intermediaries is the share of net personal intangible savings flowing through financial intermediaries. About two-fifths of all personal savings flowed through financial intermediaries in 1900-29, but more than two-thirds since the 1940's. Whatever measure is used there can be no doubt that the quantitative weight of financial intermediation shows a significant long-term rise.

Have individuals also tended to shift their choice of financial institution as a vehicle for their saving? The answer is readily found. The assets of the monetary system have declined sharply relative to the assets of all intermediaries. In 1800 commercial banks stood alone. By 1850 they probably owned over 80 percent of the assets held by all intermediaries. This share fell to about 50 percent in 1900, and today it is just over 30 percent. Showing relative gains since 1900 are private life insurance companies, savings and loan associations, and some newer institutions that have come into prominence since the 1930's — government lending agencies and insurance funds, investment companies, credit unions, and others. Chapter 8 is given over to a consideration of factors which have influenced this differential growth, and after a survey of all available data Dr. Goldsmith concludes that "the importance of different financial intermediaries as outlets for funds varies greatly among households of different wealth, income, occupation, and age."

Other relevant data on the activities of financial intermediaries since the turn of the century are presented here in useful detail. The information covers the size and distribution of financial intermediaries' assets and liabilities, their geographical distribution, the degree of

concentration of assets within the different groups of financial intermediaries, and their share in financing the main sectors of the American economy. One of the most interesting findings is that financial intermediaries have supplied approximately the same proportion of funds for external financing throughout the entire period, excluding 1930-33.

If criticism can be made of this book, it is that Goldsmith works with ratios throughout and does not investigate the possibility of stable functional relationships. In a few cases, for example, ratios change significantly over time although a few simple graphs would quickly reveal functional relationships that are remarkably steady.

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Federal Lending and Loan Insurance. By R. J. Saulnier, Harold G. Halcrow, and Neil H. Jacoby (Princeton: Princeton University Press for the National Bureau of Economic Research, 1958. Pp. xxx, 566. $12.00)

This book is the first comprehensive study to be published of an area of public finance that has expanded enormously since the early 1930's. The scope of the study is indicated by the fact that the following well-known federal agencies and programs are included: the Land Bank and Production Credit Systems, the Commodity Credit Corporation, the Rural Electrification and Farmers Home Administrations, the Reconstruction Finance Corporation, the Export-Import Bank, the Defense or V-Loan Program, the Home Owners' Loan Corporation, the Federal Home Loan Banks, the Federal National Mortgage Association, and the housing and other loan insurance programs of the Veterans and Federal Housing Administrations (the complete list takes up pp. 9-18 of the book). The annual volume of credit extended under these and the other programs covered has grown from a few hundred million dollars during the 1920's to nearly $14 billion in 1953, which is the last year included in the study (pp. 108-9).

The treatment of each credit program is divided into four parts:

(1) A succinct and fully documented description of the origins and subsequent development of the program is accompanied by statistical series showing both the volume of credit extended each year and the amount of credit outstanding at year-end.

(2) The characteristics of the loans made or insured are brought out by means of tabulations of loan sizes, interest rates, terms to maturity, and the geographic and economic characteristics of the borrowers.

(3) Profit and loss data together with such cheerless statistics as the relative number of delinquent loans, the number of extinguished loans on which some loss is suffered, and the ratio of realized net losses to total disbursements are presented to show the financial experience of the lending agencies.

(4) The economic significance of federal lending and loan insurance is

analyzed in terms of their impact on aggregate economic activity, on the allocation of resources among the different sectors of the economy, and on private financial institutions and practices.

The least satisfying parts of the book are those dealing with the economic impact of the credit programs (a fact which will surprise no one in view of the complexity of the problem). There is, for example, no analysis of what quantitative measures might be most appropriate for the different loan insurance and guaranty programs. One measure — namely, the government's contingent liability in each case — is arbitrarily chosen and simply added to the direct lending series in the chapter dealing with the economic significance of federal credit programs as a whole. No doubt the quantitative impact of loan insurance is something less than the total volume of loans insured, but there is no reason why the government's contingent liability, which may vary from 50 percent or less to 100 percent, should provide the appropriate deflated figure. The authors' procedure, furthermore, has the disadvantage of implying that the influence of the Veterans Administration housing program per dollar of mortgages insured is only slightly over 50 percent of the influence of the similar Federal Housing Administration program.

Some additional problems arise out of the very interesting analysis of the coordination that has existed in the past among federal credit, fiscal, and monetary policies. As reflections of these policies, the authors use the net volume of credit extended each year, the surplus or deficit shown in the conventional federal budget, and the net volume of Federal Reserve Bank credit extended, respectively. Unfortunately there are specific reasons why none of these series is completely satisfactory for that purpose:

(1) The net-volume-of-credit-extended series is a hybrid composed of direct loans that are reflected in federal budget expenditures, direct loans that are not so reflected, and the measures of insured loans whose usefulness has been questioned above. An analysis based upon a threefold breakdown of this sort would have been much more informative than the one given.

(2) The conventional budget surplus or deficit is inferior to the consolidated cash surplus or deficit as a measure of fiscal policy.

(3) Federal Reserve Bank credit extended omits certain important tools of monetary policy altogether (changes in reserve requirements or in the rediscount rate, for example) and may through the operation of internal cancellations, disguise the operation of others (open-market purchases may be matched by a decline in member bank discounts and advances which in turn induces banks to liberalize their lending terms).

Although this book may, by its close attention to statistical details, occasionally exhaust the reader, it cannot be said to do the same for the field of economics covered. Nevertheless, any worker in the area will find it a valuable source of information and point of departure.

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Labor Unions and Public Policy. By Edward H. Chamberlin, Philip D. Bradley, Gerard D. Reilly, and Roscoe Pound (Washington: American Enterprise Association, 1958. Pp. xiii, 177. $4.50)

The American Enterprise Association has commissioned four essays, two by economists and two by lawyers, to show that labor unions have economic and legal power and privileges that constitute a clear and present danger to society. Two of these essays, those by E. H. Chamberlin and Gerard Reilly, warrant serious consideration. The other two, by Philip D. Bradley and Roscoe Pound, despite the distinction of the authors, are less well informed, and perhaps less objective, than one could wish.

Chamberlin begins his essay by stating the inadequacy of the "received theory of wages," sketches out superficial similarities between labor markets and the kind of product markets toward the analysis of which he has made such a distinguished contribution, and concludes "that the public interest requires the imposition of major restrictions on the monopoly power of labor."

Chamberlin's analysis leads him to conclude that within organized industries wages are distributed, by the exercise of power in differentiated markets, in ways "unrelated to any rational criterion for wage differentials" (pp. 25-26).

It seems to be incumbent on a critic advancing such an argument to suggest what might be a "rational criterion" for wage differentials. Is it suggested that the market provides such a criterion? Chamberlin indicates that he is fully aware of the "imperfections" of labor markets, even in the absence of unions. But furthermore, it has always escaped this reviewer why rationality is thus synonymous with impersonal or nondeliberate determination of wages. If the criterion is the pragmatic one that wage relationships "work" in the sense that workers are more nearly content with the equitability of the relationships, one would be hard put to show that, in general, collectively determined wages are not more rational than unilaterally determined differentials. Would Chamberlin, for example, seriously suggest that wage relationships in the basic steel industry were more rational prior to 1945, when the wage structure was collectively "rationalized" by the "Grant Street Plan," than after?

Chamberlin's argument about differentials is, however, broader than this. He suggests that in raising wages for union industries and occupations, real incomes in other segments of the economy are lessened. He refers to

> not only low-income wage receivers, but also such other elements of society as "self-employed" and small business men, students, old people and other unemployables, insurance beneficiaries, pensioners, etc., etc. (p. 5).

This is a familiar argument, and we have taken it on faith too long. This reviewer tried to show some years ago that it was not true, at least as to hourly earnings of manufacturing workers, and Reder recently indicated that the trend toward lesser inequality

had continued to 1954.[1] A recent Census Bureau study of family income distribution shows no widening of dispersions in the last twelve years.[2]

These and certain other bits of evidence available are admittedly inconclusive, but the prima facie case seems to be largely against the Chamberlin restatement of the familiar hypothesis.

There are, of course, many reasons for supposing that union influence contributes to the raising of incomes, not only of workers in organized industries, but of those alleged victims to whom Chamberlin refers. The analysis completely neglects many aspects of union activities. Would social security pensioners be better or worse off without continuous union political pressure to increase benefits for both present and future pensioners? How many insurance beneficiaries are there in unorganized establishments who would have been without income on the occurrence of the insured risk, if it had not been for the emulative activities of their employers following practice of organized plants? As Chamberlin would say, "etc., etc."

Professor Chamberlin's paper is, interestingly enough, followed by Professor Bradley's defending the "free rider." Whereas Chamberlin argues that the economic power of unions should be curbed *because* they benefit those in whose behalf they bargain collectively, Bradley's argument is fundamentally based on the proposition that

> the empirical evidence creates no presumption that the mere fact of representation means that represented workers enjoy greater benefits than nonrepresented workers (pp. 63-64).

Therefore, he argues, there is no such identifiable person as a "free rider," and "compulsory unionism" is tantamount to taking something for nothing from the unwilling participant. Chamberlin may have it his way, or Bradley his, but the American Enterprise Association cannot have it both ways.

Gerard Reilly's paper deals with a real problem, that of the division of federal and state authority in labor relations matters. Reilly argues for the principle of the Smith-McClellan Bill which would have given the states concurrent jurisdiction in the field of labor relations, in much the same sense that they now have such concurrent jurisdiction with respect to legislation regulating union security. This would have allowed states to enter the area voluntarily abandoned by the National Labor Relations Board by the application of its jurisdictional standards. It would, as well, restore jurisdiction to state agencies without the necessity of a Section 10(a) cession agreement, so long as state regulation was not in conflict with federal law.

There appears to be general agreement that, on principle, neither employers, employees, nor unions should escape socially necessary regulation simply because a federal agency chooses to abandon jurisdiction.

Reilly's solution does not, however

[1] M. W. Reder, *Labor in a Growing Economy* (New York: John Wiley, 1957), p. 366, n., and reference to this reviewer's paper cited there.

[2] *Current Population Reports, Consumer Income,* Series P-60, No. 27 (April, 1958).

seem to be the appropriate one. In the Wagner Act, and in the Taft-Hartley Act which Reilly helped draft, certain substantive rights were affirmed as a matter of national public policy. The abandonment of part of its jurisdiction by the NLRB had the effect of depriving workers and employers of effective access to these established rights. If we disagree about some of these rights, let us change them. But one is constrained to agree that an administrative agency should not have discretion to decide who shall and who shall not have access to them. Neither worker nor employer should be less secure in them, for example, simply because the enterprise is small.

Allowing the states to exercise concurrent jurisdiction would not assure that they would choose to do so. It might still remain true that in a large number of states, the worker who happened to work in a small enterprise, or the small enterprise itself, would be subject to invasions of rights which we have publicly and nationally proclaimed. The better solution is a congressional mandate to the NLRB to exhaust its jurisdiction, and then to hope that the states will exercise jurisdiction in the areas constitutionally forbidden the federal government.

Dean Pound's basic argument is that unions are, under contemporary labor law, endowed with various "legal immunities," such as "have been regarded from of old as odious." These immunities, allegedly, include immunity from effective sanction for tortious acts or breaches of contract and immunity from effective sanction for restraints of trade, for infringements of "the right to work," and for interference with the duty of public service. In Dean Pound's view, only the racketeering activities of unions are not subject to such immunity.

For example, Dean Pound says that

> in theory [the Taft-Hartley Act] makes the general rule of the law of agency equally applicable to employers and employees

by making the employer only responsible for the acts of supervisors when they are within the actual or apparent scope of their authority. But he ignores the provision of the act, which, for purposes of suits, declares that

> in determining whether any person is acting as an "agent" of another person so as to make such other person responsible for his acts, the question as to whether the specific acts performed were actually authorized or subsequently ratified shall not be controlling.

This language from Section 301 would seem to be drawn so as to apply both to "agents" of employers and "agents" of unions. But this superficial view ignores the realities. In the real world, it has had application only to unions, for a damage suit by a business enterprise against a union for breach of contract is a meaningful recourse; a damage suit by a union against an employer is not. Our courts are able to see measurable damages to a business enterprise. Thus far they have, in general, been unable to see any way in which an enterprise can, by breach of its contract with a union, inflict damages on the union which are measurable pecuniarily.

But even further, under the terms of Section 301, a union can be held for

damages arising out of the acts of an "agent," even though the ordinary tests of agency do not apply. This is an "immunity" most unions would be happy to do without.

Dean Pound reiterates the worn criticism of the Wagner Act that it legislated only against employers, and created immunities for unions. In a literal sense this is true. But the effect of the Wagner Act may be looked on otherwise, as having only partially and ineffectively removed the previous legal immunity of employers against action for wrongful discharge or discrimination against employees.

It speaks ill for the cause espoused by the American Enterprise Association that it could find no better statements than the four contained in this volume. Indeed the statements are a denial of the very nonpartisanship to which the association pretends, for they seek to persuade by authority rather than by reasoned argument. Such an approach cannot advance our understanding of major labor problems.

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BUREAU OF ECONOMIC AND BUSINESS RESEARCH

The Bureau of Economic and Business Research, established in 1921, is the research department of the College of Commerce and Business Administration. Economic and business information, including material on tested business practices, is compiled by the Bureau and made available to Illinois businessmen and others interested in business and related problems. Although the major part of its work deals especially with Illinois, the Bureau also engages in general economic research.

Fields in which research is carried on include: accounting; marketing; retail and wholesale trade; resources and industries; transportation, utilities, and communications; banking and private finance; public finance, governmental regulation, and public policy; international trade and finance; labor, public relations, and welfare; and general economic developments.

The results of Bureau investigations are published in the form of research bulletins, business studies, and miscellaneous special bulletins. The following titles illustrate the scope of the Bureau's publications.

Bulletin 81, *British and American Manufacturing Productivity,* by MARVIN FRANKEL. ($1.50)

Bulletin 82, *The Structure and Policy of Electronic Communications,* by DALLAS W. SMYTHE. ($1.50)

Bulletin 83, *The Effectiveness of Pharmaceutical Promotion,* by ROBERT FERBER and HUGH G. WALES. ($2.00)

Bulletin 84, *Experience Rating in Unemployment Compensation,* by CLINTON SPIVEY. ($1.50)

Business Study 10, *The Demand for Aluminum: A Case Study in Long-Range Forecasting,* by JAMES E. ROSENZWEIG. ($1.00)

The Railroad Shippers' Forecasts, by ROBERT FERBER. ($1.00)

Determinants of Capital Expenditures: An Interview Study, by ROBERT EISNER. ($1.50)

Employers' Forecasts of Manpower Requirements: A Case Study, by ROBERT FERBER. ($1.50)

Consumer Behavior and Motivation. R. H. COLE, *Editor.* ($1.00)

Changing Structure and Strategy in Marketing. ROBERT V. MITCHELL, *Editor.* ($1.50)

The Bureau also publishes the *Illinois Business Review,* which presents a monthly summary of business conditions for Illinois.